

NORAD-FAO/UNDP GLO/82/001

CRUISE REPORTS "DR. FRIDTJOF NANSEN"

SURVEYS OF THE FISH RESOURCES OF NAMIBIA

Preliminary Cruise Report No III

September 11 - October 6 1990

Directorate of Fisheries
Namibia

Institute of Marine Research
Bergen, Norway

The "DR. FRIDTJOF NANSEN" Research Programme is sponsored by the Norwegian Agency for Development Assistance NORAD, the Food and Agriculture Organization of the United Nations FAO, and the United Nations Development Programme UNDP. The programme in Namibia is being conducted and planned under agreements between UNDP, Namibian authorities and the Institute of Marine Research, Norway. Its execution is the responsibility of the Institute of Marine Research, Bergen in cooperation with the Directorate of Fisheries of Namibia.

The programme has comprised three surveys as follows:

Survey 1,	January	25	to	March	19
"	2	May	27	-	June 20
"	3	September	11	-	October 6

Preliminary cruise reports were submitted after the completion of each of Surveys 1 and 2. This cruise report describes the work and some of the findings of the third survey.

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CHAPTER 1 INTRODUCTION

1.1 GENERAL OBJECTIVES

Following an offer from NORAD extended through FAO and UNDP, an agreement was reached in Windhoek in January 1990 between the UNDP Resident Representative and Namibian authorities for the execution of a programme of surveys of the fish resources of the Namibian shelf waters during 1990 with the R/V "DR.FRIDTJOF NANSEN".

The purpose of the programme was agreed as follows:

The main objectives are descriptions of the distribution, composition and abundance of the most important resources of fish and shellfish (although little information is expected to be obtained on lobster). The small pelagic fish, horse mackerel, pilchard and anchovy will be investigated by the acoustic integration method combined with sampling with mid-water and bottom trawls. A swept area trawl survey programme will be used for the demersal stocks. All catches will be sampled to species by weight and numbers and biological sampling will be made of the commercially important stocks.

Environmental studies will include recording of surface temperature on a continuous basis and occupation of hydrographic stations in a series of fixed profiles as well as studies of bottom type by grab samples and the ROXANN bottom discrimination system.

Possible taxonomic problems will be studied by sampling and examination by experts in cooperation with FAO's Fisheries Department.

1.2 SPECIFIC OBJECTIVES OF THE THIRD SURVEY

These are descriptions of the distribution, composition and abundance of the most important stocks of demersal fish. The acoustic system will be used to observe possible mid water occurrence of the hakes, but the observations of pelagic fish will not be processed. The swept area trawl survey programme will cover depths down to 500 m and deeper if necessary. The survey design will be based on a semi-random distribution of hauls designed to cover the depth ranges of the two hake species and with density of stations adapted to the expected fish densities. Biomass of Cape hake will be based on post-stratification by density areas. Some mid water sampling of horse mackerel will be made for observations of length compositions and growth.

A programme of testing of trawl dimensions with SCANMAR instruments will be conducted in accordance with a special plan.

1.3 PARTICIPATION

The scientific staff from Namibia were:

To September 25: Dr. Gert Cloete, Bruce Tomalin, Adriaan Beukes, Malakia Shimhanda, Quintin Hammond, Sielfried Gowaseb.

From September 25: Dr. David Boyer, Serubabel Kahiha, Johnny Gamatham, Alex Hendricks, Willem Nauseb.

The staff from IMR were: G. Saetersdal, O. Alvheim, M. Dahl and R. Johannesen.

1.4 NARRATIVE

Figures 1 a-c show the course tracks with the positions of the fishing stations and the hydrographical stations occupied.

The vessel left Walvis Bay on September 11, called on Lüderitz on September 13 and work started off the Orange River on September 14. A heavy bobbins-gear was mounted on the trawl before working the slope which in this area includes parts with rough bottom. The profile off Panther Head was occupied on September 17.

Unfavourable weather over several days with winds up to force 8 delayed the work. Catch rates of hake in the deep slope beyond 400 m were low from Lüderitz northwards and the coverage at these depths were reduced. Cape hake was found to occur in some abundance down to 350 m and the most important depth range to sample was 180-350 m. This range was then covered during daylight hours with some complementary hauls at greater depths during nighttime. The hydrographic profile north of Hottentot Point was occupied on September 20. By September 21 the shelf up to 25°S had been covered with a total of 47 bottom trawl stations.

From Dolphins Head northwards heavy densities of Cape hake was found at intermediate depths, 200-300 m. The fish could often be identified by echo-traces near the bottom (on the ES 400, 40 log R sounder) and the observation indicated that lifting from the bottom into mid water at night time was irregular, some times it was observed and some times not. Sampling in this area was therefore at times made also during night time. Most of the fish was in a prespawning or spawning condition.

The coverage from 25°S northwards to Ambrose Bay is shown in Figure 1b. Bottom conditions on the offshore shelf for the demersal trawl improved in this region and the trawl could be used without bobbins gear. A hydrographical section was worked off Concepcion Bay on September 23. The zone of soft muddy bottom with dead shells some times reaching out to 150 m of depth was a problem for sampling as was heavy by-catches of jellyfish in hauls down to 200-250 m from 24°S to 23°S. In the February survey jellyfish occurred in high densities in mid water in this area, but not in the bottom hauls as now. The vessel called on Walvis Bay on September 25 for exchange of staff.

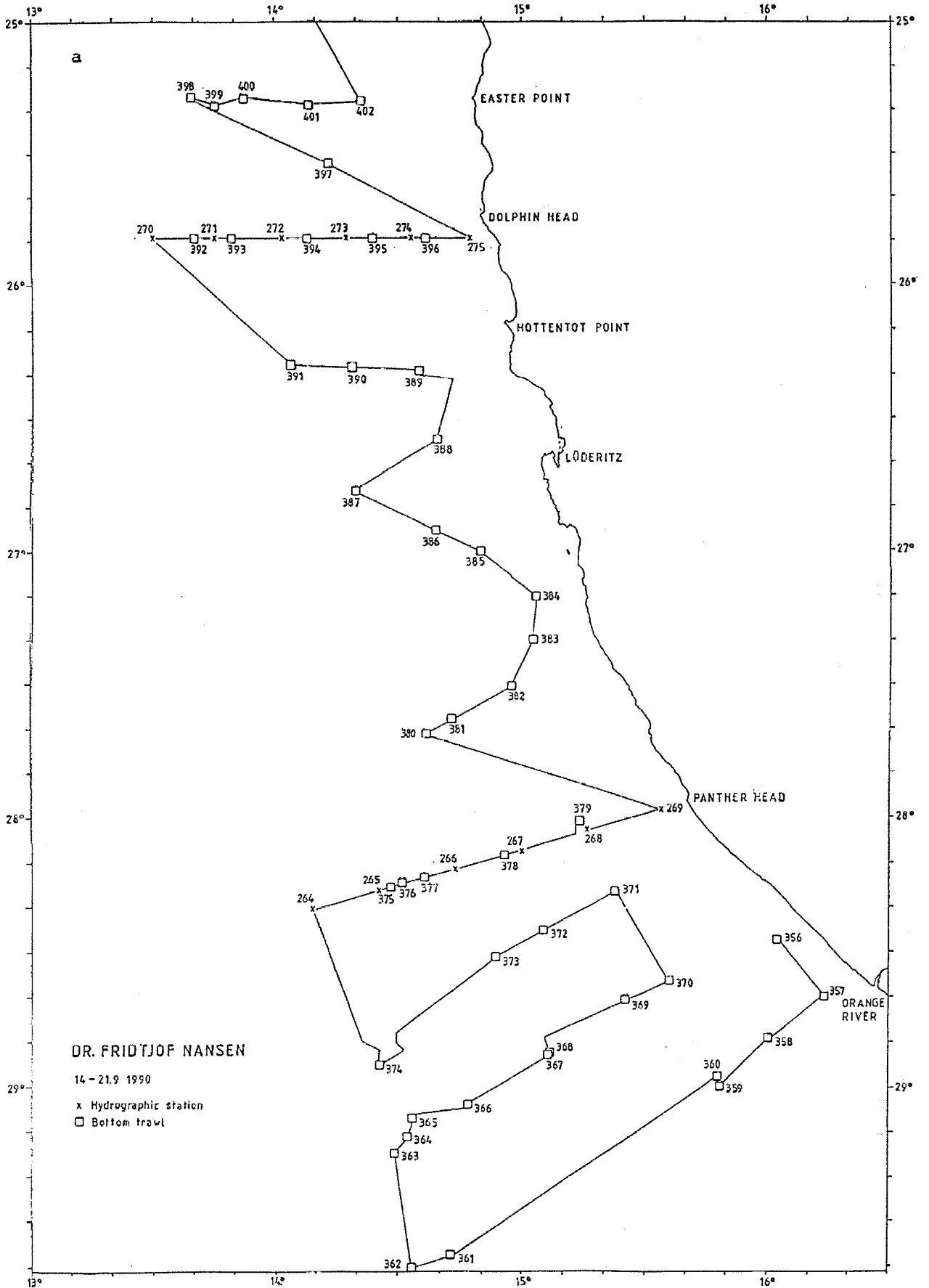
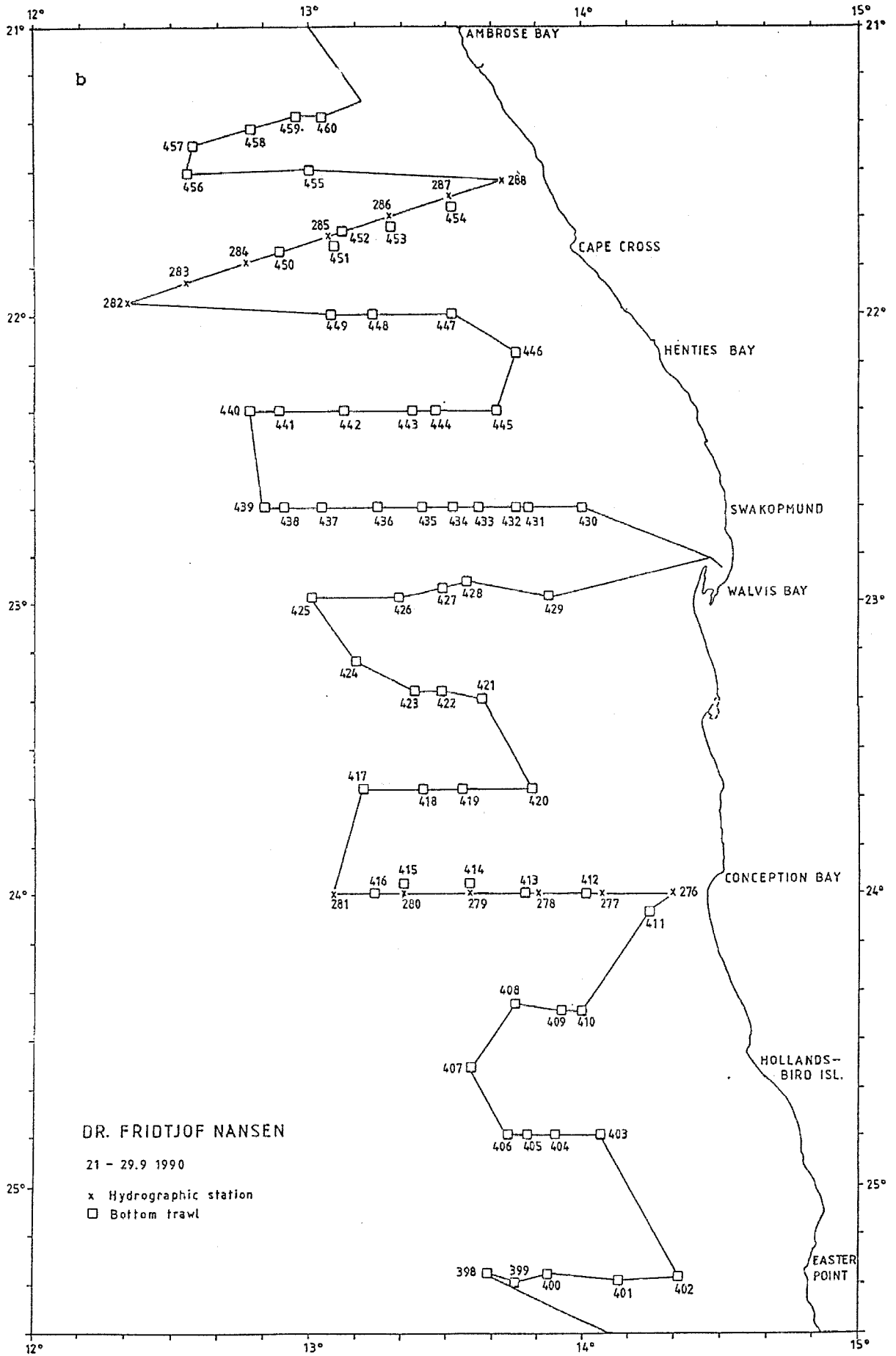
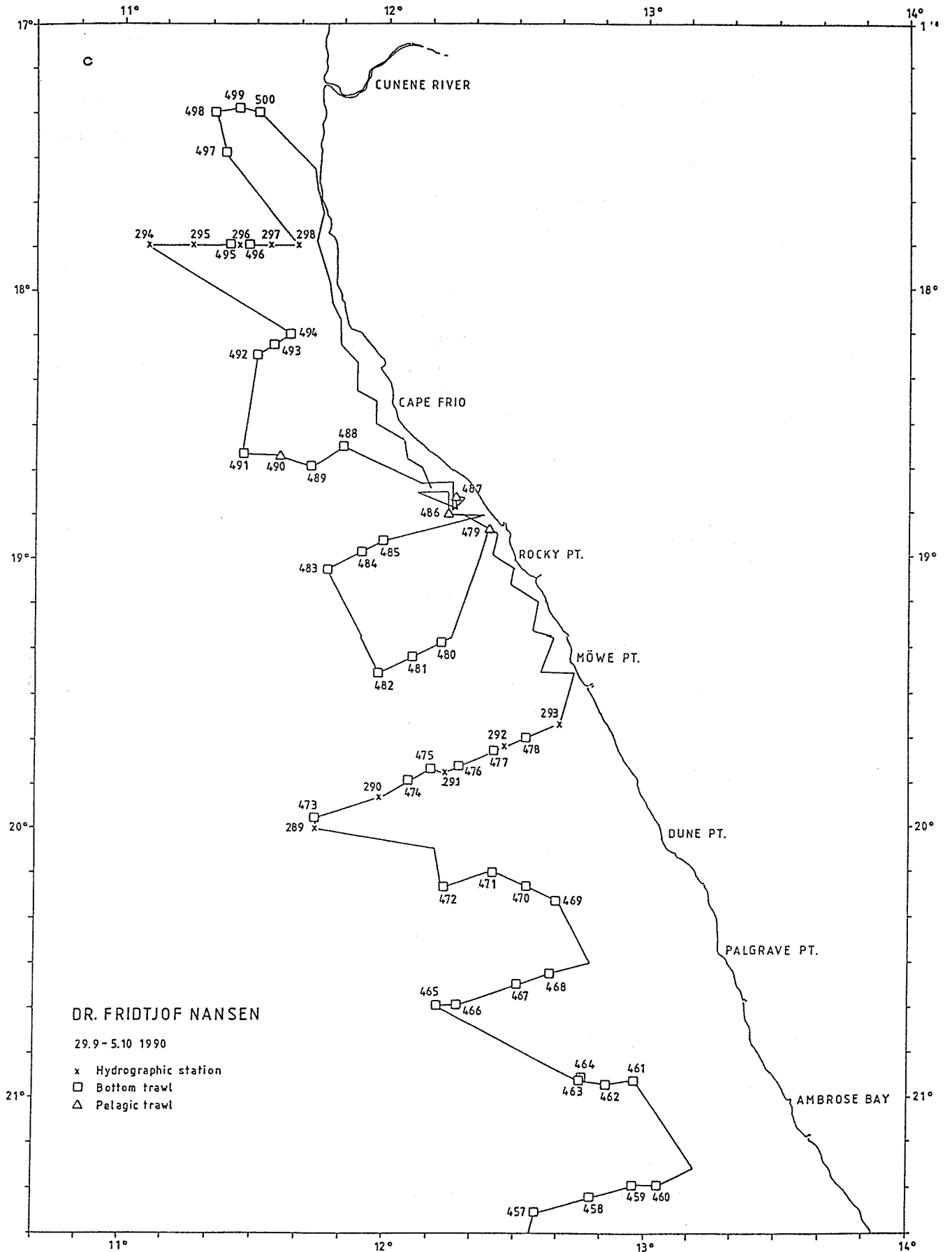


Figure 1. Course tracks with fishing stations and hydrographic profiles, a: Orange River to St. Francis Bay, b: St. Francis Bay to Ambrose Bay, c: Ambrose Bay to Cunene River.





In the continued survey from Walvis Bay northwards from September 26 soft muddy bottom with shells complicated sampling above 150 m of depth and jellyfish was a problem from 180 to 250 m of depth giving some times several tonnes of by-catch in brief hauls. During daytime heavy catches of horse mackerel was taken together with hake at intermediate depths. The horse mackerel lifted off the bottom at night. The profile off Cape Cross was occupied on September 28. The survey was completed up to Ambrose Bay by September 29 with a total of 53 swept area trawl hauls. Abundant echo traces of hake were observed off the bottom, at intermediate depths, although closer to the bottom in daytime.

The course track between Ambrose Bay and Cunene is shown in Figure 3. Catches of deep water hake were very low in this area and sampling at 400 m and deeper was restricted. Acoustic observations showed that in this area hake was distributed in mid water both day and night and this was confirmed by pelagic trawling. Catches in bottom trawl would thus underestimate the biomass. The profiles off Dune Point and Cape Frio were worked on October 1 and 4 respectively. The nights to October 2 and 3 were spent surveying for pelagic fish inshore south of Cape Frio. The work was terminated on October 4 with 34 swept area and 4 pelagic trawl hauls in the northern area. Steaming inshore past Cape Frio during the first night the vessel docked in Walvis Bay at noon on October 6.

1.5 INSTRUMENTS AND FISHING GEAR, OBSERVATIONS ON TRAWL GEOMETRY

The acoustic instruments and their setting are shown in ANNEX III together with a description of the fishing gear used. Some observations were made with SCANMAR instrumentation on headline height and distance between wings of the type of bottom trawl used by the vessel in the Namibian surveys. This is a 31 m headline high opening shrimp and fish trawl. Table 1 shows the results.

Table 1. Observations of headline height and distance between wings during trawling. Means of 4-6 observations. m.			
St. nr.	Depth	Distance	Hight
360	173	20.3	5.5
367	165	19.4	5.4
397	202	18.9	5.7
455	253	16.5	4.8
464	322	18.9	5.3
500	150	17.5	6.2

The position of the wing sensors were slightly more forward on stations 360 and 367 than in the following experiments. The experiments at stations 455-500 were with a different net of the same design. The low values obtained at station 455 may have been caused by a catch of jellyfish which is expected to result in heavy drag of the net due to clogging. The overall mean of the observations of distance is very close to the value used in the swept area estimates 1/100 nm, 18.6 m. The SCANMAR measurements indicate that in normal hauls the distance may be somewhat greater, but perhaps lower with by-catches of jellyfish. For the present survey there does not seem to be any need for an adjustment of the figure used.

CHAPTER 2 THE ENVIRONMENT

2.1 THE SHELF AND THE SLOPE

Table 2 shows the approximate extensions of the areas between the various depth ranges along the coast revised in accordance with new observations based on GPS navigation. For some incompletely covered areas depth observations from Spanish fishing charts have been used.

	100-250m	250-350m	350-450m	450-550m
Orange R. -25°	12 000	3 300	3 000	1 700
25° - 21°	8 300	3 700	1 700	700
21° -Cunene R.	5 100	2 700	1 600	800

2.2 HYDROGRAPHY

Figures 2a-c show the sea temperature at 4 m of depth as observed with the ships thermograph and Figures 3a-c show the distribution of temperature, salinity and oxygen in the 6 hydrographic transects worked. The position of the transects are shown in Figures 1a-c.

The surface temperature over the southern shelf is 2-4°C lower than observed in February with a shoreward decline typical for the coastal upwelling process. Off Lüderitz the surface isotherms follow the bottom configuration. The inclination of the isolines of the profiles demonstrate intensive upwelling. Both temperature and salinities indicate an origin of the upwelled water from 200-300 m of depth. The oxygen content of the bottom water layer is above 1 ml/l over the whole shelf.

As shown in Figure 2b the surface temperature over the shelf from St. Francis Bay to Ambrose Bay is 1 to 2°C higher than over the southern shelf. The profile off Cape Cross indicates a less vigorous process of upwelling than that off Conception, a probable effect of a period of calm weather after the call on Walvis Bay on September 25.

The surface temperature over the northern part of the shelf, see Figure 2c is again 1-2°C higher than over the St. Francis Bay to Ambrose Bay part of the shelf with the 15°C isoline approaching the coast near Cape Frio. The profiles off Mwe Point and to the north of Cape Frio, Figure 3 c show inclination of isolines indicating a reduced rate of upwelling northwards, which could be related to the preceding persistent period of calm weather.

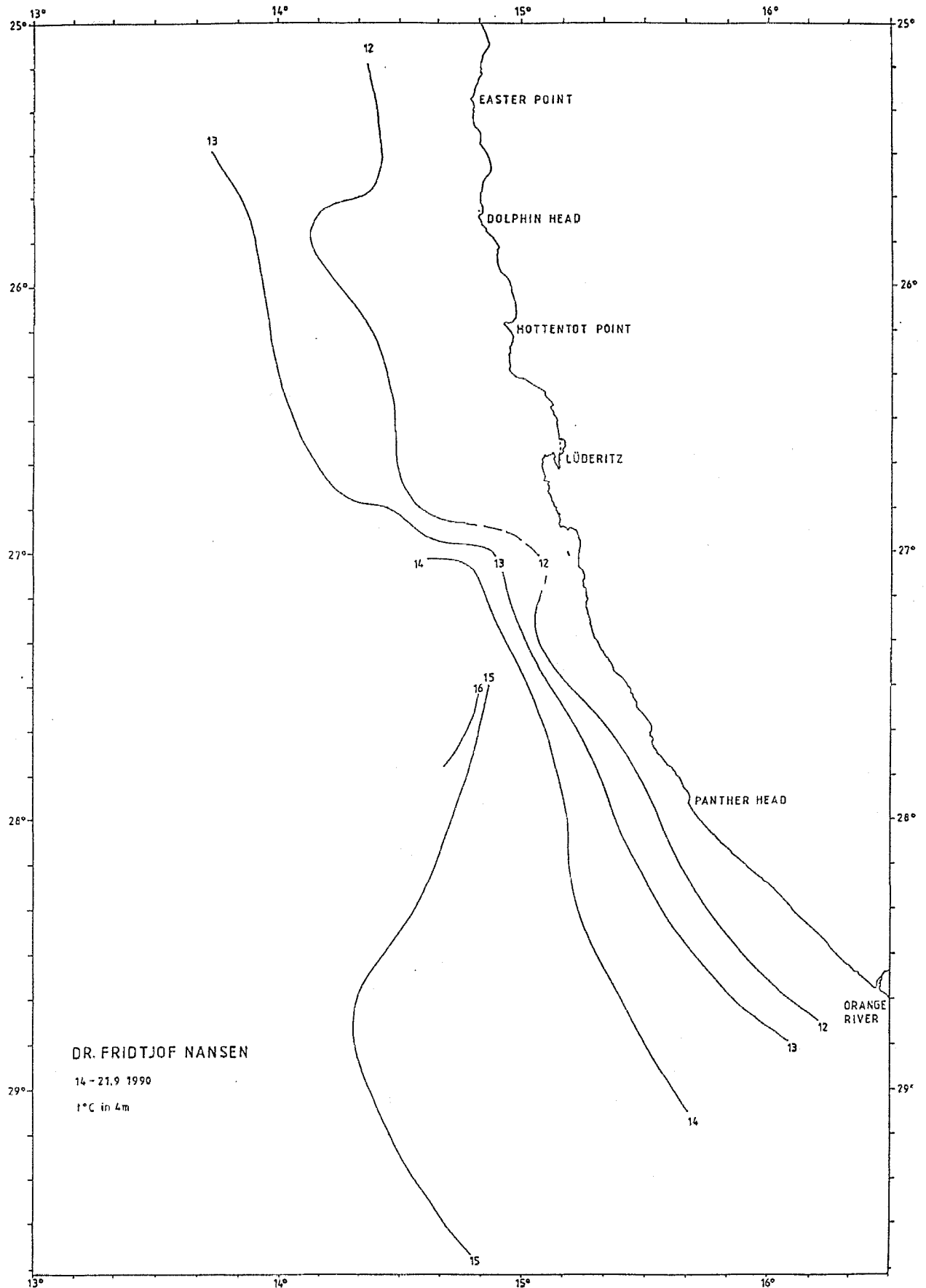
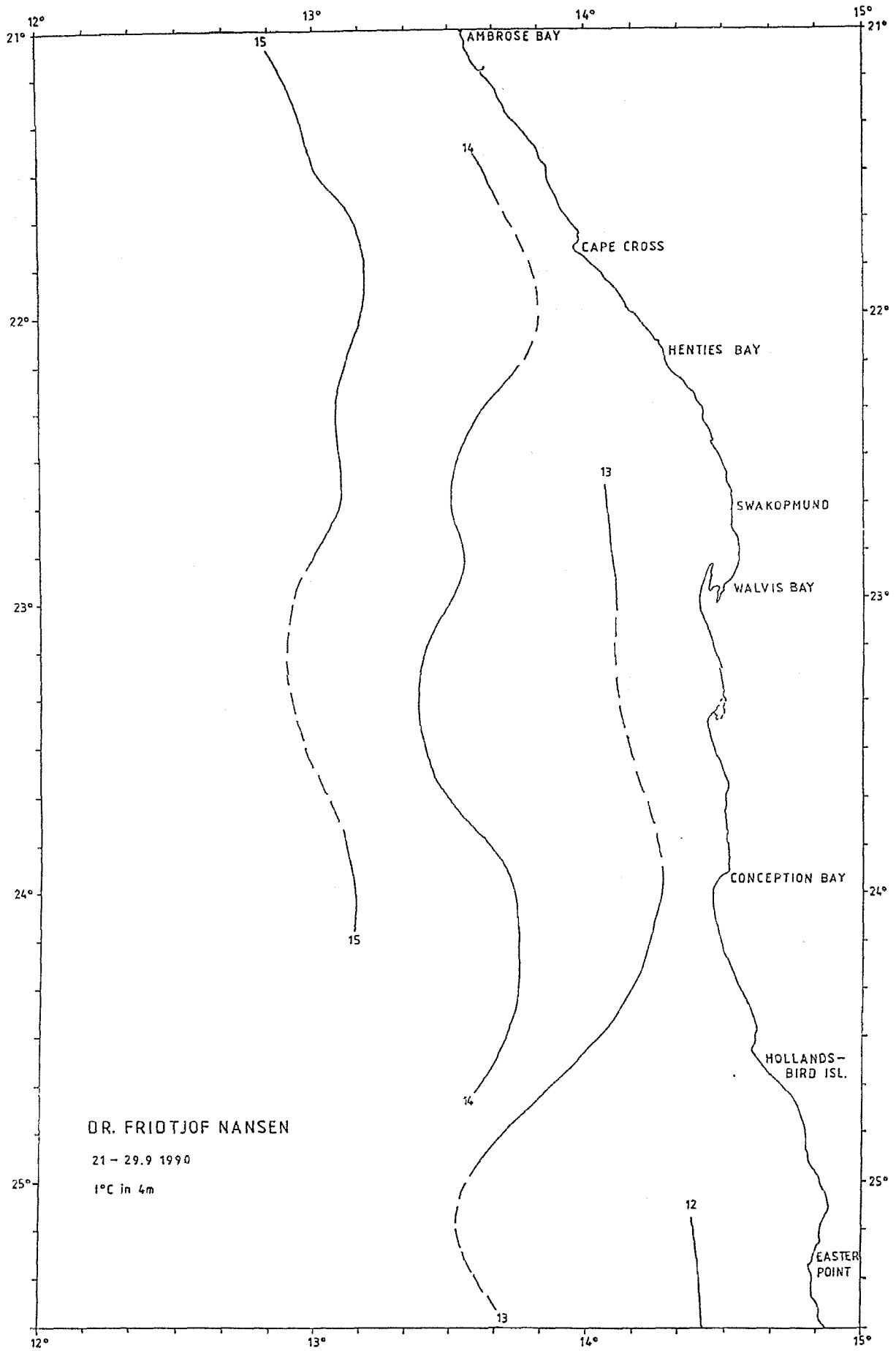
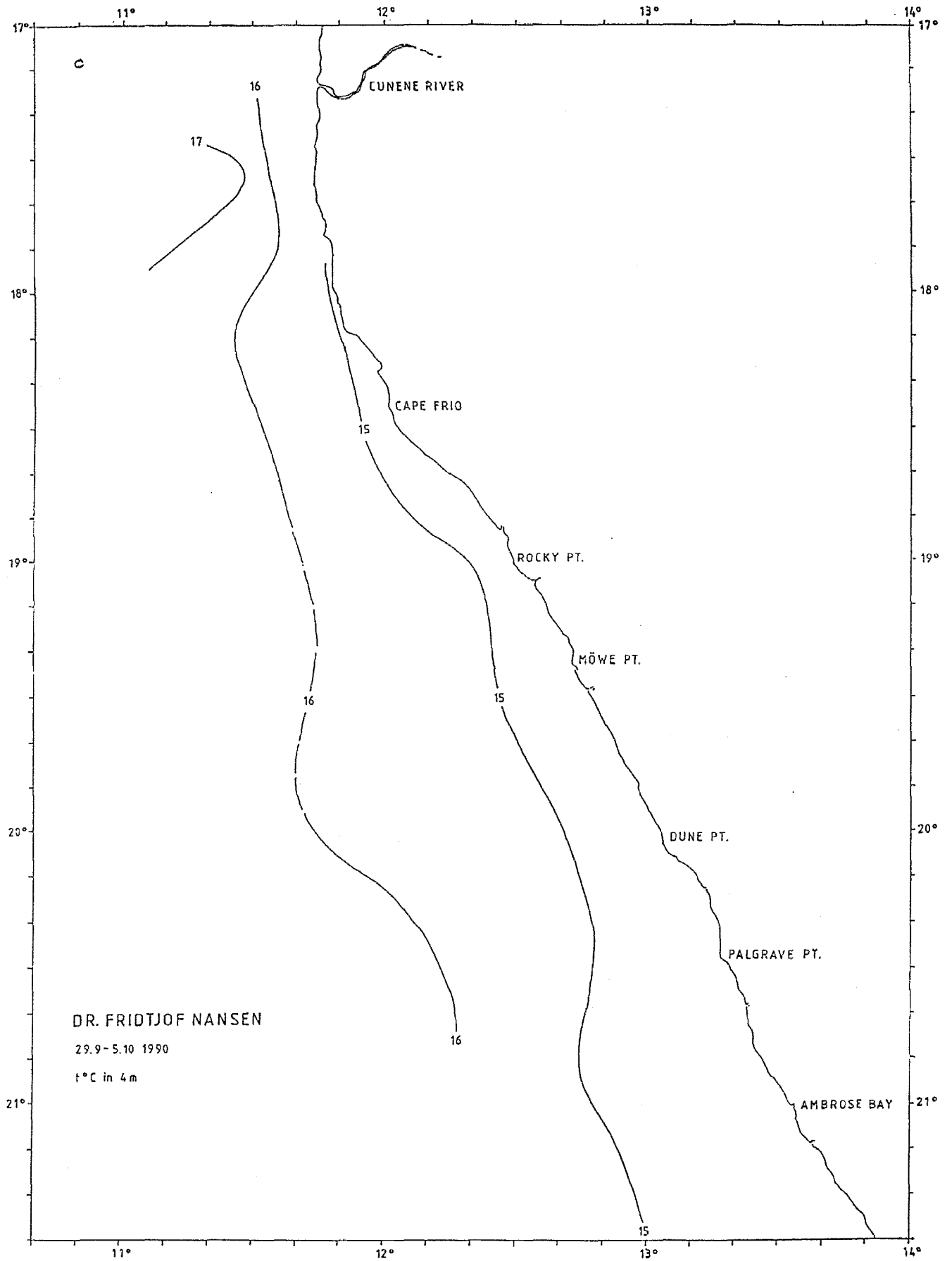
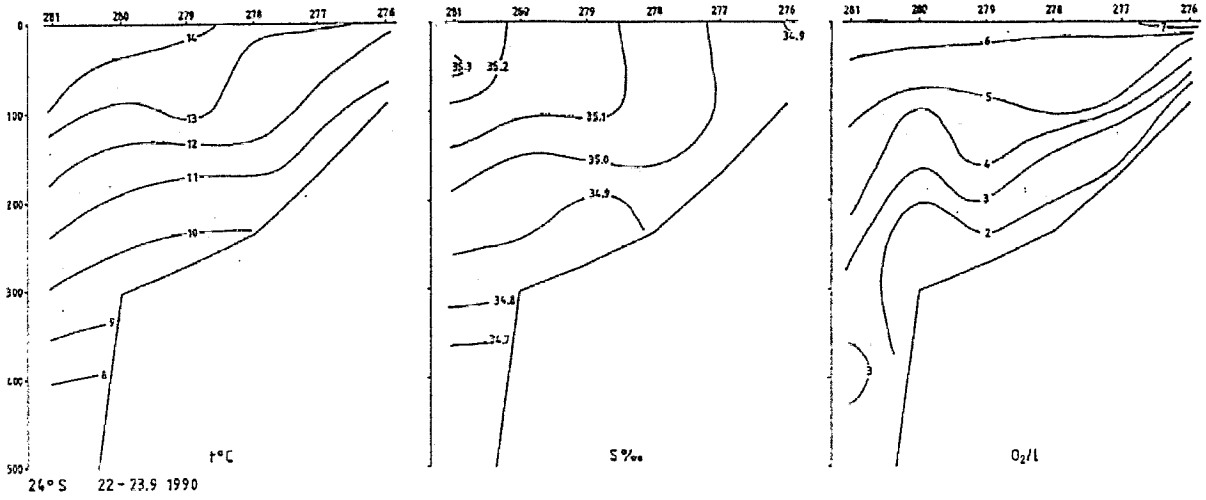


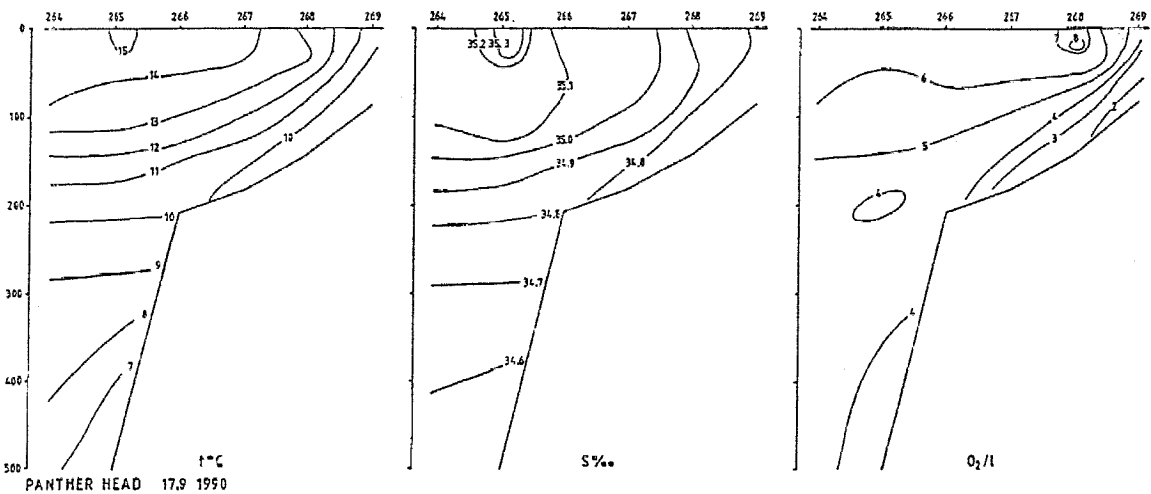
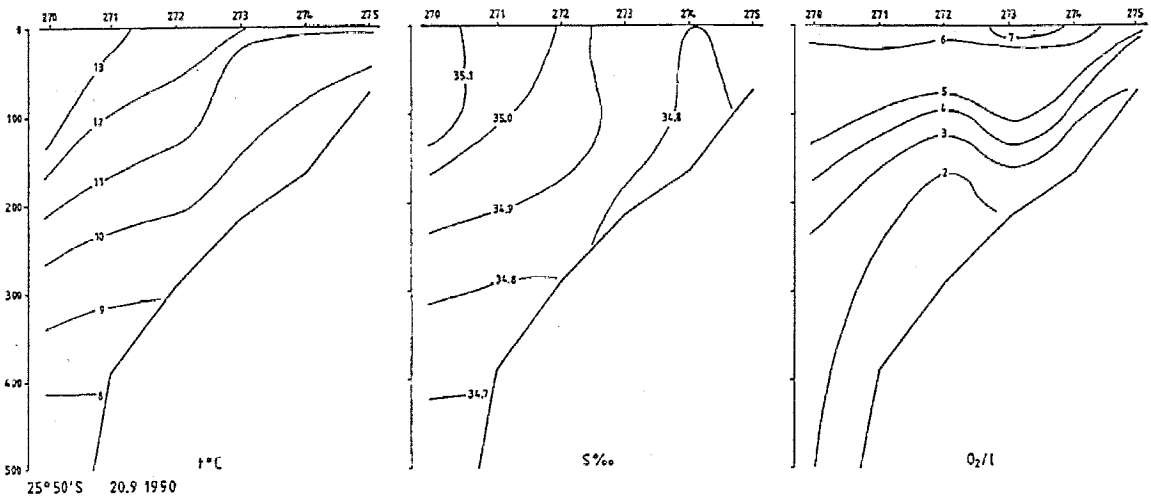
Figure 2. Temperature at sea surface : a: Orange River to St. Francis Bay, b: St. Francis Bay to Ambrose Bay, c: Ambrose Bay to Cunene River





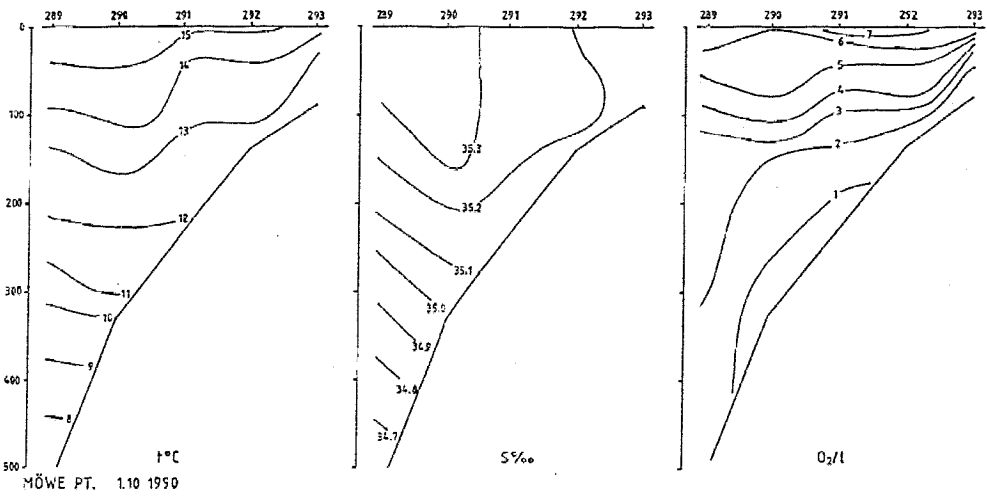
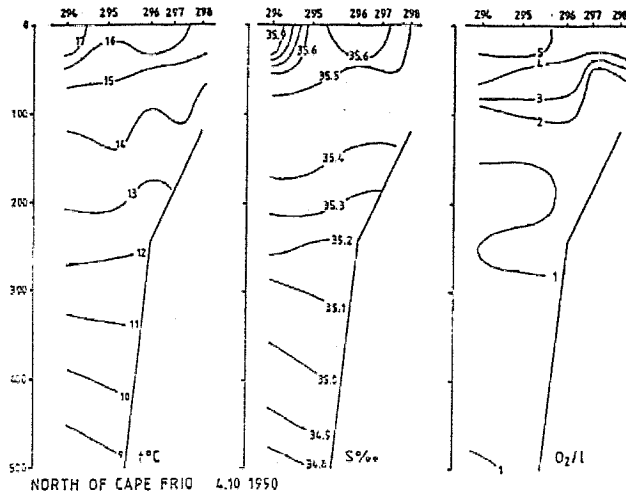


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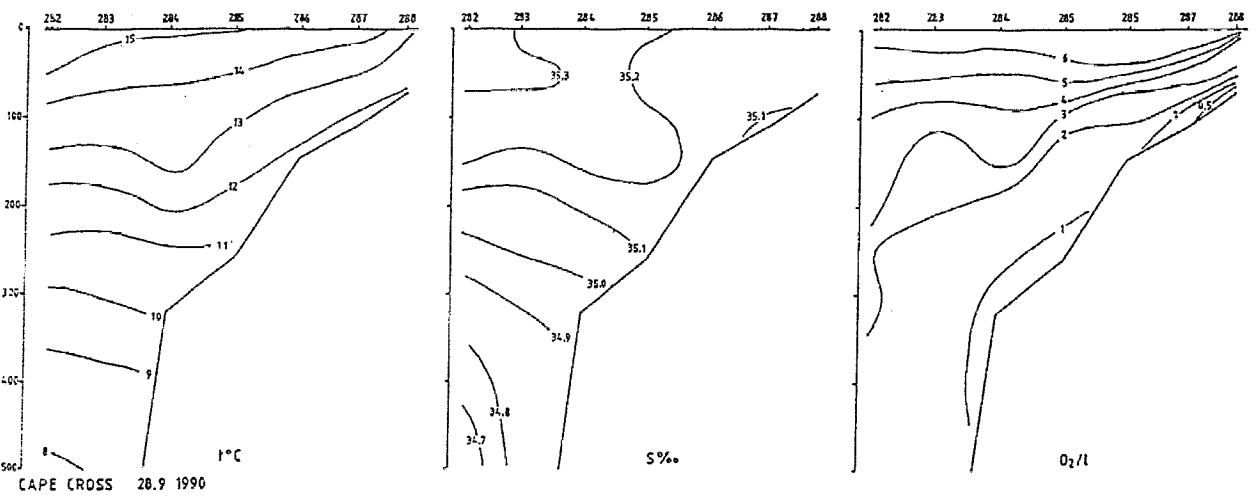


a

Figure 3. Hydrographic profiles. a: Orange River to St. Francis Bay, b: St. Francis Bay to Ambrose Bay, c: Ambrose Bay to Cunene River.



C



CHAPTER 3 OBSERVATIONS ON PILCHARD IN THE CAPE FRIO AREA

Aims and methods

The aim of this survey was to determine the biomass of pilchard in the Cape Frio/Rocky Point region of northern Namibia.

A preliminary survey was planned between a commercial purse seiner and the R/V "BENGUELA", to be followed by two separate biomass estimation surveys by the "Dr. FRIDTJOF NANSEN" and R/V "BENGUELA". If time permitted the R/V "BENGUELA" would cover the area a second time, thus allowing a comparison of the estimates between the two research vessels and between two consecutive surveys with the same vessel.

Unfortunately the scientific equipment on the R/V "BENGUELA" was inoperative and therefore she was unable to take part in the survey.

The "Dr. FRIDTJOF NANSEN" only had part of one night for the core survey area (21H00 to 05H00) and part of two nights for the adjacent areas. The surveys of the areas immediately north and south of the Cape Frio region gave an indication of the dispersion of pilchard in this northern region.

Results

The purse seiner determined the main distribution of the pilchard as being from 10 nm north of Rocky Point ($18^{\circ}52'S$) to False Cape Frio ($18^{\circ}30'S$) with the area of densest concentration being from 12 nm to 24 nm north of Rocky Point ($18^{\circ}50'S$ to $18^{\circ}42'S$). During the day the fish formed dense shoals in waters of 25 to 35 m depth, while at night they dispersed into two layers.

The upper layer, which occurred extensively from waters of 40 m bottom depth to a depth of more than 100 m, was from the surface to just below transducer level (some 4 to 6 m below the surface). A surface trawl showed that this was small horse mackerel with a modal peak length of 14 cm (range 12 to 16 cm).

The second layer was from about 10 to 20 m below the surface. This lower layer was considerably less extensive occurring in waters of 40 to 60 m deep. A trawl targeted on this layer and on several small dense shoals within the layer yielded 96% large pilchard (modal total length 22 cm, range 19 to 24 cm) with 4% small horse mackerel (modal total length 12 cm, range 9 to 15 cm).

Both layers occurred as far north as $18^{\circ}46'S$, while during the latter part of the night the pilchard formed shoals resulting in some very high integrator values.

The biomass estimate for this area of pilchard was 35 000 tonnes.

The surveys to the north and south of this core area determined that small amounts of pilchard were present in these areas. Close to Möwe Bay an estimated 3 250 tonnes was surveyed, while at Rocky Point a further 8 150 tonnes was found. To the north of Cape Frio a few shoals of pilchard were found 15 nm south of the Cunene ($17^{\circ}28'S$), while a small amount also occurred

5 nm north of Cape Frio (18°25'S). No biomass estimates were produced for these latter concentrations.

It must be concluded that the fish surveyed in this region by the "Dr. FRIDTJOF NANSEN" in June have moved out of our region, possibly into Angolan waters. Surveys of southern Angolan waters by the Dr FRIDTJOF NANSEN report, finding in February and August 1985 and February 1989 large concentrations of *Sardinops ocellata* (25 000 tonnes, 120 000 tonnes and 50 000 tonnes respectively), while surveys conducted in April and November 1985 and 1989 found less than 10 000 tonnes on each occasion. This suggests some movement of fish between Angolan and Namibian waters.

CHAPTER 4 RESULTS OF THE FISHING EXPERIMENTS, CATCH COMPOSITIONS AND SWEEP AREA BIOMASS ESTIMATES OF DEMERSAL FISH

All catches were sampled for composition in weight and numbers by species and size sampling was made of important species, using total length. The complete records of fishing stations are shown in ANNEX II.

4.1 ORANGE RIVER TO ST.FRANCIS BAY

Compositions of catches

To show changes by depth the catches from the shelf down to 250 m of depth are analysed separately from those of the slope 250-500 m. Table 3 shows the catch rates standardized to kg/hour by main groups in hauls from the shelf and the slope separately. Hakes form the main part of the catches and the two species will be analysed separately below.

Cape horse mackerel was after the hakes the most abundant species in the catches with high rates especially in the southern part of the area. The species was represented by large size mature fish, see Annex I. The catches of other demersals shown in Table 2 consisted of small by-catches of monk *Lophius upsicephalus*, kingklip *Genypterus capensis*, John dory *Zeus faber*, and west coast sole *Austroglossus microlepis*. Catch rates for John dory and kingklip were very low compared with those obtained in Survey I in February. Snoek *Thyrsites atun* was on the other hand considerably more abundant at this season appearing in bottom trawl catches even at 350 m of depth. The squids consisted of the lesser flying squid *Todaropsis eblanae* and flying squid *Todarodes sagittatus* in the slope, mainly from 250 to 550 m and a few cuttlefish in shallower waters.

Table 3. Orange River to St. Francis Bay. Catch rates by main groups in bottom trawl hauls standardized to kg/hour for the shelf and the slope hauls.

SHELF 50-259 m

ST.NO.	DEP.	Hakes	Horse mck.	Other dem.	Snoek	Squid	Other
356	79	57.0	0.2	1.4	4.0	2.2	54.7
357	82	82.6	2.0	2.7	3.9	7.8	130.6
358	144	126.8	20.4	1.6	7.6	5.2	2.4
359	173	88.0	162.4	6.4	19.2	10.8	56.4
360	173	163.8	38.3	5.4	1.6	1.5	26.0
366	209	388.6	3427.2	12.8	31.0	16.0	156.2
367	165	125.3	4.7	14.8			30.9
368	164	219.2	21.8	18.9	5.4	5.8	150.8
369	182	183.0	233.4	6.6	3.0	3.9	73.8
370	161	359.2	50.4	4.8	2.6	15.6	17.6
371	140	105.4	156.4	0.2	52.2	2.1	32.8
372	174	344.8			30.6	1.8	121.2
373	183	329.0	1.6	5.2	110.0	8.6	90.6
377	212	272.9	2.2		317.5	7.4	61.9
378	191	185.4	60.0		12.2	0.1	15.3
379	153	92.8		12.0	2.6	0.2	15.0
382	251	630.0				2.4	9.0
383	174	213.0	6.0			2.0	21.2
384	155	50.0	3.8				58.6
385	199	176.0	7.6				100.2
386	250	348.0	11.6	1.6			102.4
388	212	1137.6	7.2	2.0		3.0	3.0
389	253	805.0	10.0	3.6		18.0	49.0
390	246	22.4	3.3			2.0	24.9
394	249	830.4	8.2			21.6	25.3
395	195	226.0	4.6			10.0	35.2
396	150	280.0	3.2				23.2
397	204	773.7				8.4	5.1
400	249	1147.0				9.2	4.5
401	197	1438.4					3.2
402	157	468.0	11.0				21.0
MEAN		376.4	137.3	3.2	19.5	5.4	49.1

SLOPE 260-600 m

ST.NO.	DEP.	Hakes	Horse mck.	Other dem.	Snoek	Squid	Other
361	398	27.0				0.1	5.3
362	510	10.0				8.6	87.4
363	449	130.6		5.1		2.6	40.1
364	351	279.6	17.6	2.8		3.6	28.6
365	292	456.5	470.8	27.4	48.6	40.7	36.5
374	351	49.4		20.0			33.2
375	454	1.8		0.6		1.5	54.0
376	353	364.6	28.6		402.4		69.6
380	392	5.0	1.2		3.2	0.2	7.8
381	349	32.0			128.8	4.0	5.0
387	351	475.6				8.6	4.5
391	350	381.2	8.1			99.9	43.3
392	454	1.5		0.1		1.3	12.8
393	349	539.0				54.2	89.5
398	402	23.6		7.0		98.0	275.8
399	310	779.4				7.2	36.8
MEAN		222.3	32.9	3.9	36.4	20.7	51.9

Total number of stations : 16

The hakes

The two species Cape hake *Merluccius capensis* and deep water hake *Merluccius paradoxus* were as previously found to be fairly well separated in their depth distribution at about 300 m of depth, see Table 4 which shows the mean densities by depth ranges and the corresponding mean catch rates with the type of trawl used.

	100-250m	260-350m	360-450m	460-550
Cape hake				
Density	11.5	6.1	0.1	
Catch rate	350	180		
Deep w. hake				
Density	0.1	6.3	1.2	0.4
Catch rate		190	36	12
No of hauls	28	9	6	1

Compared with the situation in February the density of the Cape hake has shifted somewhat towards deeper water.

When plotted in a chart the observations of densities by fishing stations of Cape hake form a pattern of levels which reflects the distribution of this species over the shelf, see Figure 4. The inshore hauls approaching the 100 m depth line show generally low densities. The patches of high density were found between 150 and 250 m particularly in the range 200 to 250 m. The fish was in a spawning and pre-spawning condition.

For the deep water hake there is an indication of decline of densities along the slope northwards from a mean of 6.6 tonnes/nm from off Lüderitz south to 1.0 tonnes/nm in the northern area.

Annex I shows the pooled size compositions of the Cape hake by depth ranges. The well known increase of size with depth is clearly demonstrated, but one should note that small sized fish 25-30 cm of length is present also below 250 m. A comparison with the size compositions for the corresponding depth ranges from Survey I in February shows a shift to the right of the modal sizes of the two lowest groups demonstrating fish growth over the intervening period. The similarity of the two sets of size compositions is a strong indication that the same population of Cape hake has been sampled in the two surveys.

An approximate estimate of the size composition of the total stock of Cape hake in Div. 1.5 can be obtained by combining the two size compositions weighted by the fish biomass of the depth strata. (A more appropriate weighting would be by numbers of fish in each strata. This method will be used when length/weight relationship becomes available). This is shown as "Total stock" in Annex I. As in February this composition is dominated by the 2+ group, but with the modal length increased by growth. The 1+ group which occurred with a modal length of 10-11 cm in Survey I now appeared with a mode in the 16-17 cm range. This group does not show high abundance in the catches. This small size of fish may not have entered fully into the area

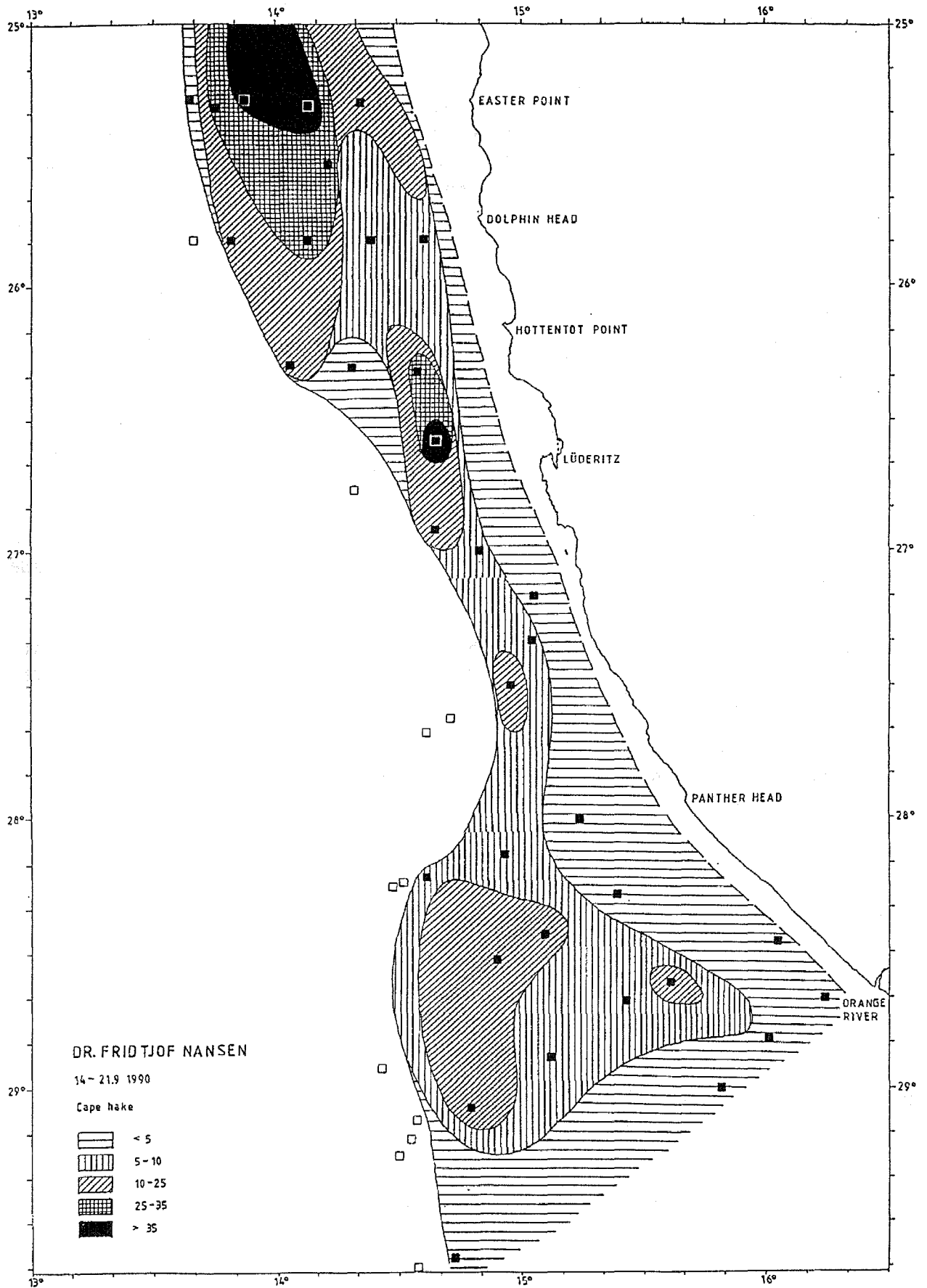


Figure 4. Orange River to St. Francis Bay. Distribution of Cape hake. Density strata based on observation of catch rates at fishing stations. Tonnes/nm².

surveyed, but one should perhaps not have too high expectations to the recruitment from this yearclass.

Assuming an effective trawl mesh size of 110 mm and a selection factor of 3.3 for the hake with a 20 cm range between the 10% and the 90% retention lengths the fishable part of the "Total stock" in Div. 1.5 would be 20% by numbers and 36% by weight. These may be somewhat underestimated because low numbers of large sized fish tend to disappear in percentage frequency distributions of large number of pooled samples.

The size composition of the deep water hake for all depth ranges is shown in Annex I. Compared with the February survey results there is now a dominant group of young fish at about 30 cm. In addition a juvenile group at about 20 cm of length (not included in the distribution in Annex I) appeared in two of the catches.

Assuming as above an effective mesh size of 110 mm, 35% by numbers and 46% by weight would be available as the fishable stock.

The prelocated trawl stations which are distributed in a semi-random way to cover the various depth zones in which the hakes are found can be used for estimates of the total biomass of the stocks by the swept area method. The assumptions used here for these calculations are: a catchability coefficient $q = 1$ i.e. all fish in the path of the trawl between the wings are caught, and the effective wing spread = 18 m (1/100 of a nautical mile). 44 successful hauls were made for this purpose in the area.

For the Cape hake an estimate based on post-stratification by levels of densities (Figure 4) gives a total stock biomass of 130 000 tonnes. The corresponding estimate from the February survey was 120 000-140 000 tonnes.

A biomass estimate of the deep sea hake applying the mean densities by depth strata to their areal extensions gives a total of 25 000 tonnes, compared to 22 000 tonnes in Survey I. The fishable part would be 12 000 tonnes.

4.2 ST. FRANCIS BAY TO AMBROSE BAY

Composition of catches

Table 5 shows the catch rates standardized to kg/hour by main groups from the shelf and the slope hauls separately. Besides hake the catch rates of horse mackerel at intermediate depths in the northern part of the area were very high especially when considering that the hauls are positioned randomly in advance. The other demersal fish consisted mostly of monk with a few catches of west coast sole at intermediate depths.

Table 5. St. Francis Bay to Ambrose Bay. Catch rates by main groups in bottom trawl hauls standardized to kg/hour for the shelf and the slope hauls.

SHELF 50-250 m

ST.NO.	DEP.	Hakes	Horse mck.	Other dem.	Snoek	Squid	Other
403	162	200.0					
404	227	3278.7		30.0			217.2
409	253	442.0	6.8	78.0		18.2	58.8
410	199	1120.5	8.3	243.8	39.0	12.0	12.8
411	115						240.0
412	202	1110.8					25.4
413	245	478.0					12.0
419	228	1128.4		16.8		25.2	208.6
420	179	395.5	1.8			0.3	15.5
421	167	879.6	7.2				15.6
422	236	904.8				3.4	22.8
427	251	646.5					18.0
428	149	94.8					
429	140						
430	120	63.6	27.6				
431	128	1600.0	640.0	80.0			20.0
432	130	1505.2	6486.8		14.0		
433	135	515.2	5353.6				11.2
434	184	380.8	21.6			0.2	5.2
435	256	1003.6	37.7	11.7		10.4	328.1
442	250	948.0		4.8		4.8	192.0
443	209	3238.4	704.0	8.8			35.2
444	170	4935.0	2310.0				126.0
445	126	970.2	204.6	4.8			123.6
446	112						
447	135	1105.5	653.4				
448	177	1794.0	1150.0				115.0
449	253	178.2	49.0	13.6		1.0	21.1
452	200	3468.4	1263.6				361.4
453	144	1350.8	3520.0			0.2	18.0
454	109						
459	251	768.8	37.5	1.9			59.1
460	184	306.0	3060.0	12.0			128.0
MEAN		1054.9	774.1	15.3	1.6	2.3	72.4

SLOPE 260-600 m

ST.NO.	DEP.	Hakes	Horse mck.	Other dem.	Snoek	Squid	Other
405	274	1155.0	5.2	7.6		58.6	282.1
406	363	445.0		32.0		6.0	300.0
407	389	52.0		5.8		4.6	37.0
408	316	298.4		47.9	1.6	4.0	182.9
414	270	0.9					2.1
415	306	22.8					6.1
416	460				1.4	3.0	7.7
417	382	42.6	2.0	10.2		13.5	163.7
418	270	982.8	21.0	51.8		2.9	121.1
423	310	132.5	4.0	7.4		10.8	28.5
424	400	53.9		38.5		9.4	265.2
425	484	72.0				13.2	384.0
426	354	122.0	2.4	6.2		4.2	52.8
436	292	328.8	10.8				47.2
437	307	172.0	22.0	16.4		14.0	31.6
438	351	60.0	2.0	13.4		8.8	92.4
439	499	10.2		10.4			317.8
440	447	15.6	4.0			6.0	226.9
441	355	120.6		3.6		6.4	81.2
450	303	166.0	20.0	37.0			15.0
451	262	52.2	2.0	5.0		2.4	15.4
456	556	19.2		95.4	2.4		312.0
457	450	8.2		2.8		4.8	302.2
458	321	184.0	2.2	14.0		8.8	91.2
MEAN		188.2	4.1	16.9	0.2	7.6	140.3

The hakes

The density of Cape hake was higher in this area than in Div. 1.5 while that of the deep water hake was lower, see Table 6. The density of Cape hake is by far highest in the 100-250 m range.

Table 6. Depth distribution of the two hake species, St. Francis Bay to Ambrose Bay. Mean densities tonnes/nm ² and mean catch rates kg/hour.				
	100-250m	260-350m	360-450m	460-550
Cape hake				
Density	38.6	8.3	2.5	
Catch rate	1160	250	75	
Deep w. hake				
Density	0.2	0.4	0.9	0.9
Catch rate	6	12	30	30
No of hauls	26	7	8	3

The plots of catch rates for the Cape hake give a density distribution as shown in Figure 5. The highest densities were found in the depth range 150-230 m. The results may to some extent have been affected by sampling problems in some areas resulting from high densities of jellyfish near the bottom and in the northernmost part of the area by fish lifting off the bottom also in daytime. The effect of both of these factors is likely to have a tendency of underestimate of the true density.

The size distributions based on a large number of samples pooled are shown by depth ranges in Annex I. Also in this area the well known increase of size with depth is clearly demonstrated. A comparison with the size compositions for the corresponding depth ranges for this area from Survey I in February shows a shift to the right of the modal size of the main group in the 20 to 30 cm range demonstrating fish growth over the intervening period. The similarity of the two sets of size compositions is a strong indication that the same population of Cape hake has been sampled also in this area. An estimate of the size composition of the total stock has been made by adjusting for the depth dependent size through weighting by the biomass of the depth strata, shown as "Total stock" in Annex I. There is little evidence of the presence of the 1+ group which appeared in February with small numbers with a modal size of about 13 cm.

The application of a mesh selection of a 110 mm trawl mesh shows that 25% by numbers and 41% by weight would be fishable. This is an increase over the similar estimates from Survey I.

An estimate of the total biomass based on post-stratification of the density estimates from the 53 swept area trawl hauls in the area gives 219 000 tonnes. The fishable part of this using a 110 mm trawl net would be about 90 000 tonnes.

A biomass estimate of deep sea hake based on the densities by depth strata and their areal extensions is 6 000 tonnes compared to 4 000 tonnes in Survey I.

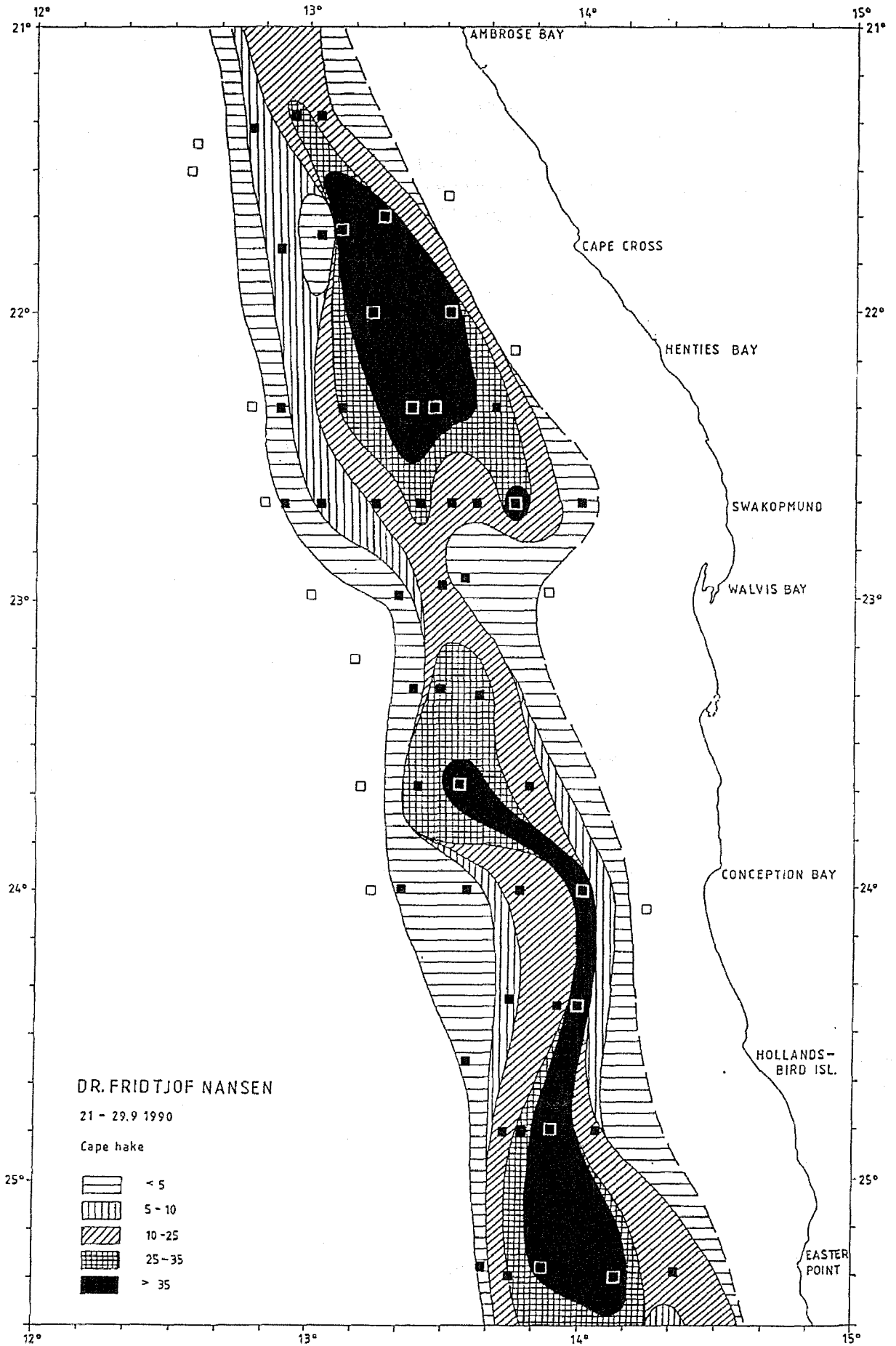


Figure 5. St. Francis Bay to Ambrose Bay. Distribution of Cape hake. Density strata based on observations of catch rates at fishing stations.

4.3 AMBROSE BAY TO THE CUNENE RIVER

Composition of catches

Table 7 shows the catch compositions by main groups. High catch rates of Cape horse mackerel were obtained at intermediate depth in part of the area and acoustic observations of occurrence in mid water of this species were widespread and abundant. Large eye dentex *Dentex macropthalmus* appeared in the shelf catches in the north. The African mud shrimp *Solenocera africana* appeared in all the catches in the 250-350 m range.

Table 7. Ambrose Bay to Cunene. Catch rates by main groups in bottom trawl hauls standardized to kg/hour for the shelf and the slope hauls.

SHELF 50-259 m

ST.NO.	DEP.	Hakes	Horse mck.	Other dem.	Sharks	Squid	Other
461	181	710.6	18.7				41.7
469	141	1825.2	924.3	54.6	65.7		97.5
470	181	1328.0	68.0		8.0		22.0
471	240	945.0	189.0	108.0	110.1		426.6
475	254	722.5	30.2	13.4			121.0
476	204	1890.0	378.0		1.0		107.8
477	143		19500.0				
478	125	90.0	4.3	0.8			1.0
480	180	2060.0	336.0	29.3	60.0		98.0
481	240	516.0	252.0	8.0			31.8
484	239	495.0	18.0				39.9
485	197	561.0	22.0	7.3			44.0
488	158	734.4	14.4	64.8	90.0	13.0	146.3
489	237	453.0	9.0	8.0	4.0		144.1
493	220	1051.5	10.5	90.0	54.9	18.0	508.3
494	151	183.6	99.0	9.0			236.6
496	219	260.8	11.6			7.2	27.2
499	222	871.0	15.0	11.0		12.0	170.9
MEAN		822.5	1217.8	60.2	21.9	2.9	142.7

SLOPE 260-600 m

ST.NO.	DEP.	Hakes	Horse mck.	Other dem.	Sharks	Squid	Other
462	276	281.2	15.6	19.6	6.2	7.6	56.4
463	321	372.8	4.0	0.8	2.0	4.0	33.6
464	322	380.0		12.5	2.5	2.5	7.0
465	452	9.8			47.2	8.4	311.7
466	351	157.6	0.4	16.0	5.0	15.0	63.2
467	308	704.0	49.6		1.2	7.2	5.8
468	264	528.4	65.6	32.6	26.4		40.5
472	285	408.0	120.0		12.0		34.0
473	500	20.0				10.0	408.4
474	301	429.1	4.2	9.8	8.0		68.9
482	297	215.8	13.0	15.0	3.0		25.7
483	300	209.2	7.3		0.1		48.4
491	296	428.0	4.0		7.0	20.0	125.3
492	300	167.4	7.4		18.0		263.4
495	288	1074.4	6.8	18.5	41.6		840.9
497	306	740.8	7.2	67.2	14.4	7.2	67.0
498	355	504.8	4.8	12.8	26.6	13.6	62.0
MEAN		390.1	18.2	12.1	13.0	5.6	144.8

The hakes

Table 8 shows that in this area the Cape hake was found to have a higher density in deeper waters than further south, but the density over the shallow depth range 100-250 m was significantly lower than in the area St. Francis Bay to Ambrose Bay and also lower than that found in March in the northern area. The plots of catch rates for the Cape hake give a density distribution as

	100-250m	260-350m	360-450m	460-550
Cape hake				
Density	25.9	15.1		
Catch rate	780	450		
Deep w. hake				
Density		0.1	0.4	0.6
Catch rate			10	20
No of hauls	18	14	1	1

shown in Figure 6. As in the March survey a belt of high density is found along most of the shelf over intermediate depths.

The size distributions by depth ranges are shown in ANNEX I. As in Survey 1 the Cape hake in this northern area is distinguished by a larger size. The distributions are similar to those observed in March, but shifted to the right, presumable through the effect of growth. With a trawl mesh of 110 mm 51% by numbers and 60% by weight would represent the fishable stock.

The biomass estimate based on post-stratification of the densities from the swept area hauls gives a total of 105 000 tonnes. This is significantly lower than the estimate of 180 000 tonnes made in March.

As mentioned in part 1.3 Narrative, the behaviour of the hake in this area differed from that observed further south in that the fish occurred off the bottom in mid water not only during night time as some times observed further south and on the first survey, but also during the day. The fish was observed in a typical single fish layer extending up to 20 to 40 m and more off the bottom, easily identifiable, but its identity also confirmed by mid water trawling. Hake is known to be a mid water feeder and acoustics has been a method of assessment in other areas. As observed in this survey the pelagic hake was very often mixed with schools and layers of horse mackerel, myctophids and layers assumed to represent euphausiids which all give higher acoustic back scattering than the dispersed hake layers and thus mask their integrator contribution. Ordinary echo integration of the pelagic hake was therefore not feasible.

In order to obtain an impression of the magnitude of the underestimate which the mid water distribution of the hake must cause in the density estimates based on bottom trawl catches only, the integrator contribution was recorded in a channel covering a depth range from 5 to 15 m above the bottom. The observations are limited to areas where only hake appeared to be present in the depth recorded and represent mean integrator readings over 5 nautical miles expressed as 1/10 m reflecting surface per nm. The following results were obtained:

Depth range	No.obs.	Mean	Range
150-259m	9	1.24	0.4-2.7
260-500m	17	1.79	0.4-5.0

In the absence of specific information of the target strength of hake use was made of the relation $TS=20 \log l-72$ used for several species in northern areas. Assuming a mean fish length of

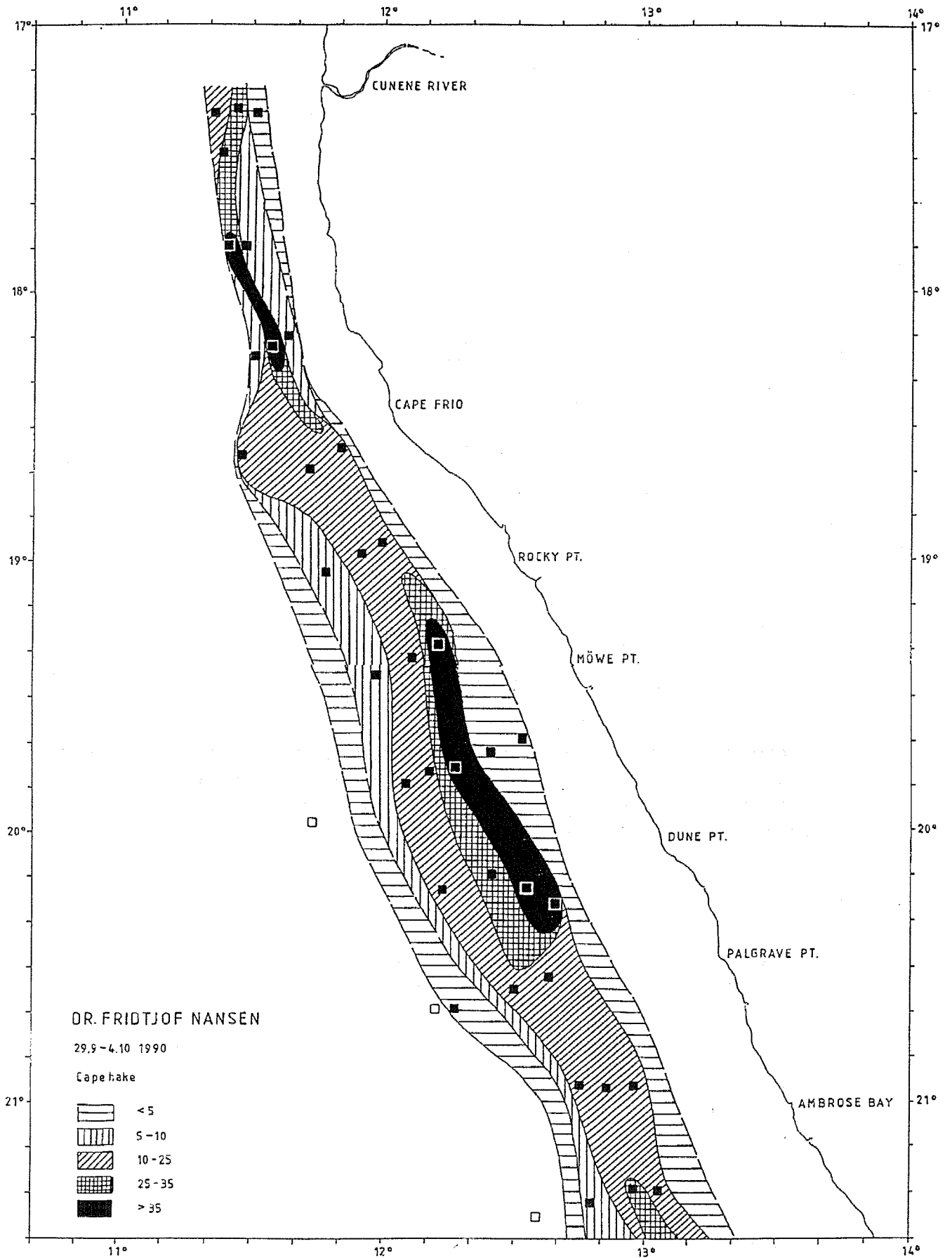


Figure 6. Ambrose Bay to Cunene River. Distribution of Cape hake. Density strata based on observations of catch rates at fishing stations

34 cm the observed integrator readings represent areal densities of 7 and 10 tonnes per nm respectively. The densities of the hake layer further up from the bottom could as mentioned above not be measured acoustically, but simple observations showed that it could range above 50 m from the bottom. If an average of a 25 m layer is assumed, the densities quoted above would be doubled. This can be calculated to increase the observed biomass by 75-100%. This is a rough estimate only, being limited by problems of basic method. It can, however, be claimed that a source of very significant bias of the swept area estimate has been demonstrated to exist for this survey and that the true hake biomass is undoubtedly much larger, perhaps the double of the estimate. An proved assessment can only be obtained by a future survey, either at a season with a different hake behaviour or by use of more sophisticated equipment for observing and processing the acoustic back scattering of the various targets.

CHAPTER 5 CONSIDERATION OF THE SURVEY RESULTS

The swept area trawl survey, the main objective of the programme, was successfully accomplished between September 11 and October 6 with a total of 141 bottom trawl stations covering the whole Namibian shelf. Acoustic observations indicate that in the northern part of the shelf, especially from Ambrose Bay to Cunene the catches in the bottom trawl must have underestimated hake density due to occurrence in mid water. An attempt has been made to evaluate the order of magnitude of this underestimate.

The analysis of data from successive surveys may, in addition to data on fish distribution, composition and abundance and biological parameters, also provide information relating to stock identity and stock structure. Figure 7 shows the size compositions estimated for the total stocks in each of the sub-areas and for each of the surveys. The size compositions within each of the areas are seen to be similar between surveys, but with an expected shift to the right of the main group caused by growth in the intervening period. There is at the same time a similar difference in size composition between the areas in each of the surveys with a trend of increasing size towards the north, and in particular showing an apparently distinct composition of larger sized fish in the northernmost area. This demonstrates that the stocks in the sub-areas have maintained a certain measure of identity over this period of time. A difference in the state of maturity was observed with fish in the two southernmost areas found to be prespawning or actively spawning while that in the northern area was resting fish in a non-spawning state. The fish in the north also demonstrated a difference in behaviour with abundant presence in mid water also in the daytime. Further series of data are needed to firmly establish whether sub-stocks do exist and what degree of mixing occurs over a period of time.

The consistency found in the size compositions in each of the areas represents a strong indication that in a general way the survey method is functional and can be expected to give relevant results.

Table 9 shows the biomass estimates of the Cape hake and the deep water hake for each of the areas as obtained by the February-March survey and that of September-October. For the two southernmost areas the estimates are similar. Added, there is an increase of Cape hake from 310 000 tonnes to about 350 000 tonnes. For the northern area the last survey gave a significantly lower estimate. It is thought, however, that this can be fully explained by the special behaviour of the fish in this area. Hake was found in abundance in mid water above the bottom also during the day. An evaluation of the magnitude of the resulting underestimate by the swept area method,

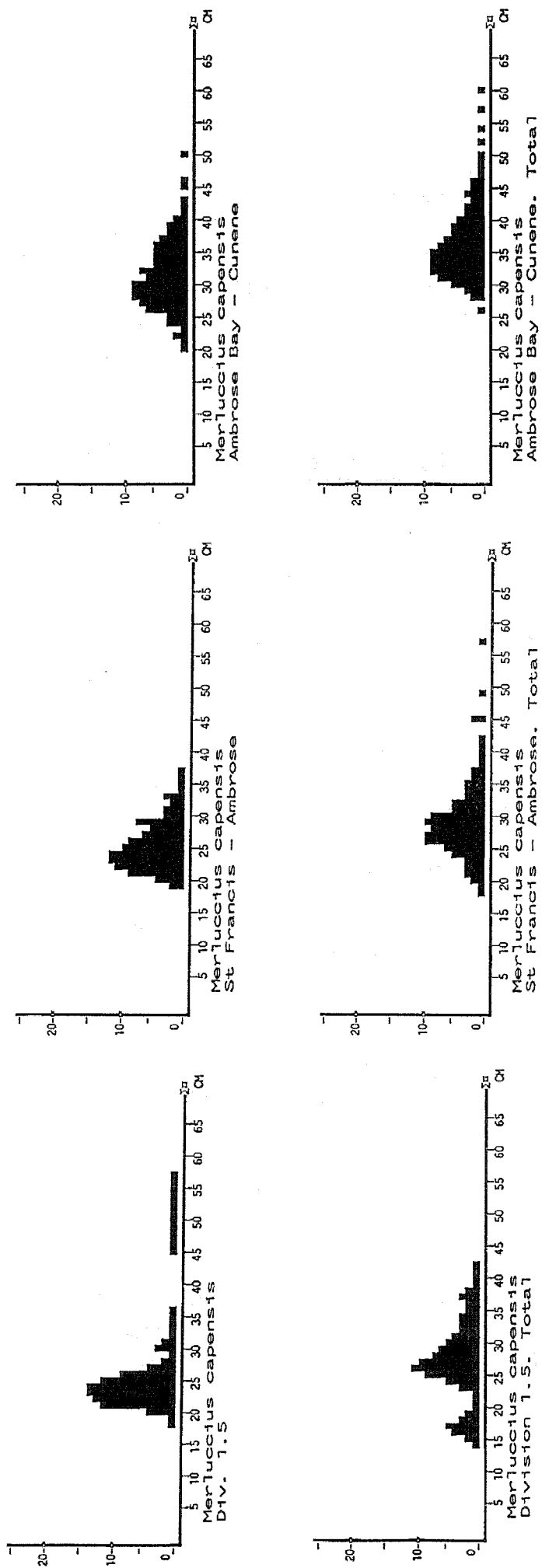


Figure 7. Estimated size compositions for the stocks in each of the areas and for each survey.

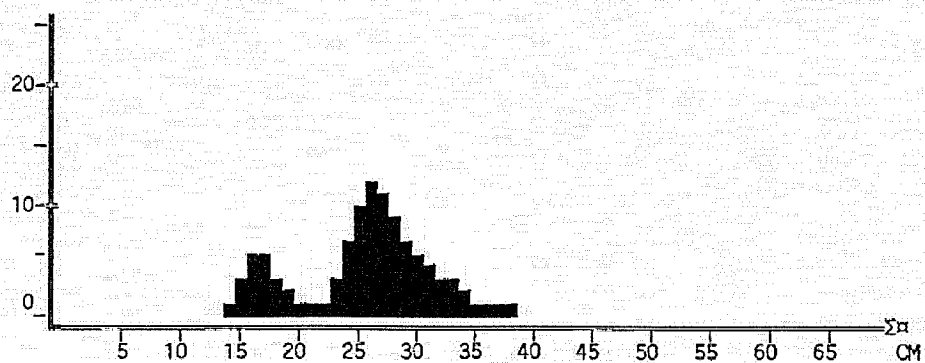
Table 9. Summary of estimates of biomass for the two hake species by surveys and areas. Tonnes.

	Total biomass	
	Febr-March	Sept-Oct
Orange River-		
St. Francis Bay		
Cape hake	130 000	130 000
Deep w.hake	22 000	25 000
St. Francis Bay-		
Ambrose Bay		
Cape hake	180 000	219 000
Deep w.hake	4 000	6 000
Ambrose Bay-		
Cunene River		
Cape hake	180 000	105 000+
Deep w.hake	800	1 000

based on sampled acoustic observations of hake density in mid water, showed that it was considerable and could well explain the discrepancy between the two survey results.

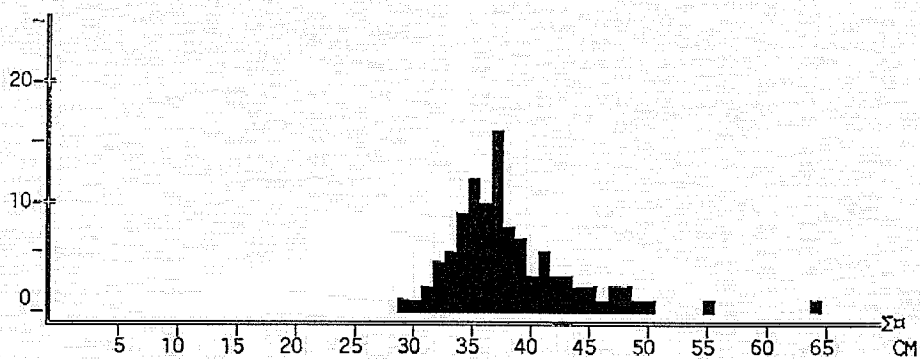
Viewed as a whole the survey results should be taken as a confirmation that the Cape hake stock is in a state of recovery. As demonstrated by the first survey there is an important young component in the stock which also now dominate in abundance, but at an expected higher fish size resulting from growth. If fishing mortality is maintained at a low level this group should contribute to an urgently needed increase in the component of larger sized fishable hake.

ANNEX I



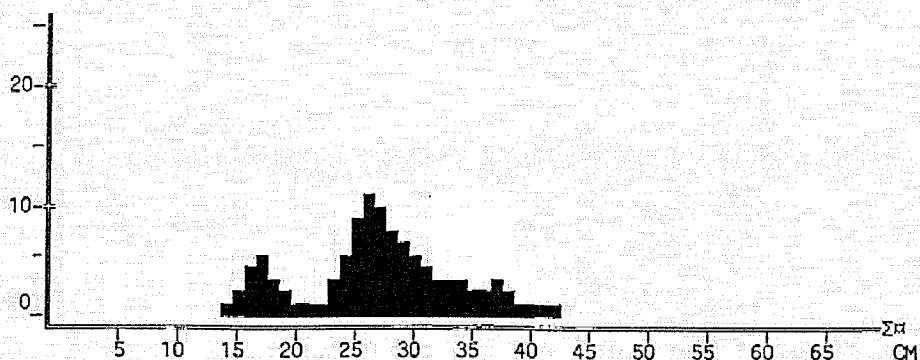
Merluccius capensis
Division 1.5. 50-259m

Pooled sample (simple adding)
MEAN LENGTH = 26.29cm N= 9107

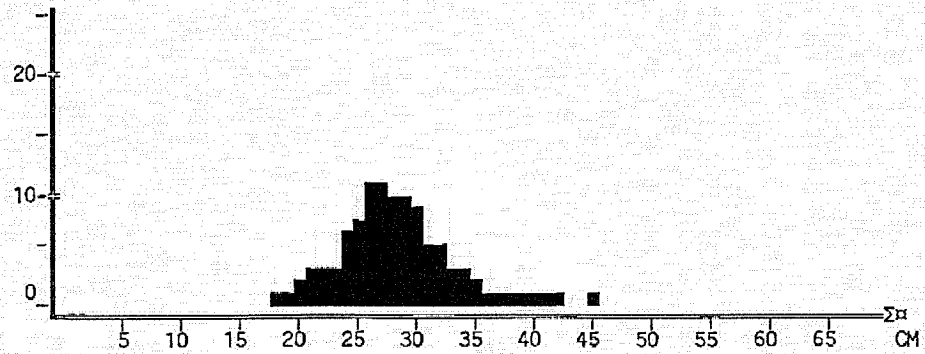


Merluccius capensis
Division 1.5. 260-600m

Pooled sample (simple adding)
MEAN LENGTH = 38.66cm N= 567

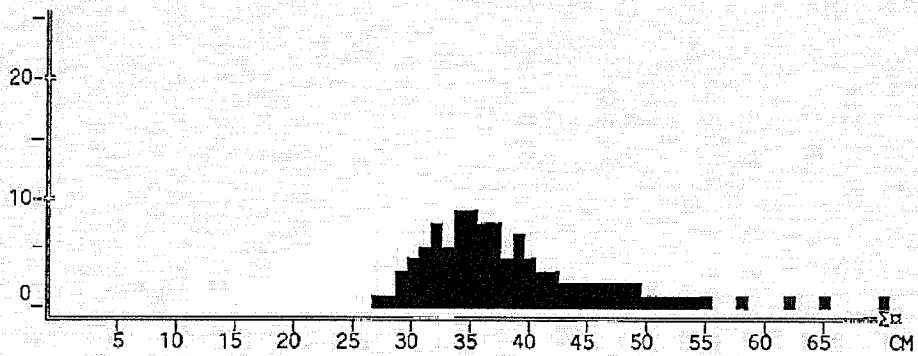


Merluccius capensis
Division 1.5. Total



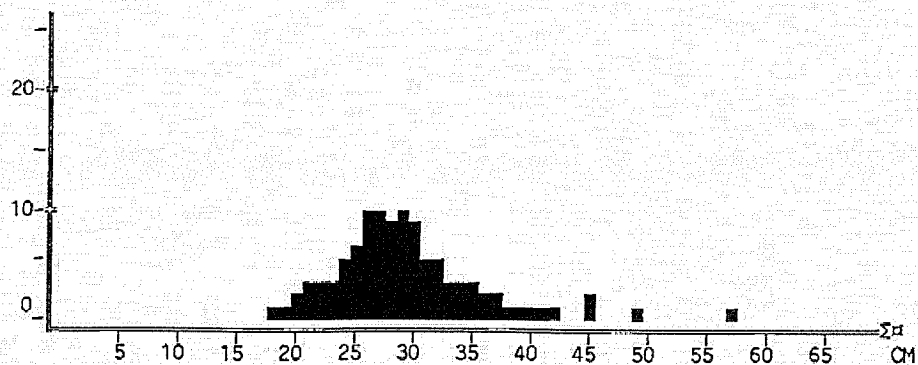
Merluccius capensis
St Francis - Ambrose. 50-259m

Pooled sample (simple adding)
MEAN LENGTH = 29.01cm N= 6997

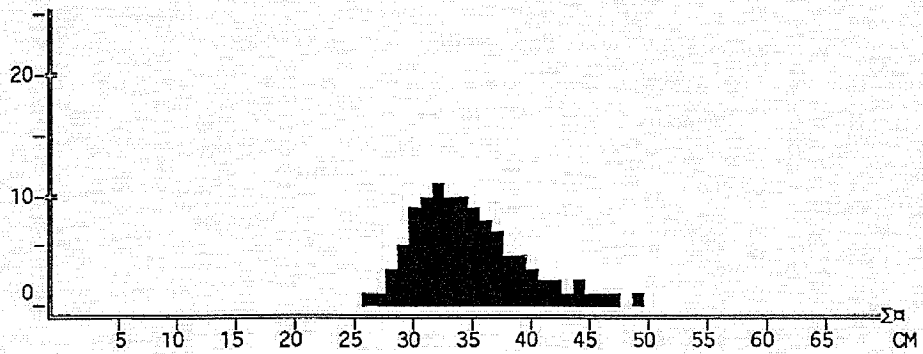


Merluccius capensis
St Francis - Ambrose. 260-600m

Pooled sample (simple adding)
MEAN LENGTH = 39.19cm N= 1696

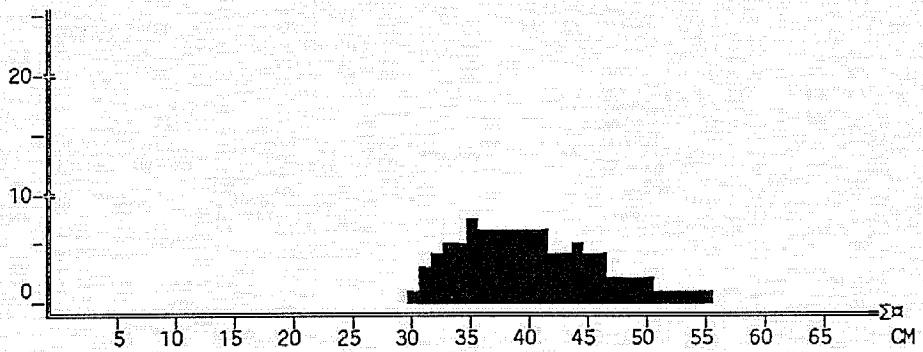


Merluccius capensis
St Francis - Ambrose. Total



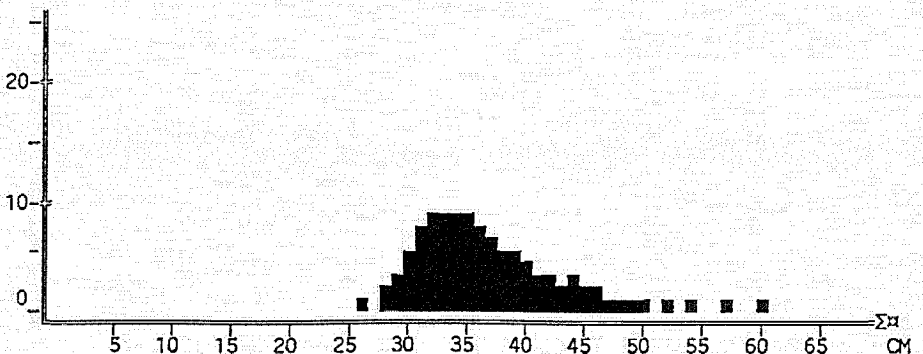
Merluccius capensis
Ambrose Bay - Cunene. 50-259m

Pooled sample (simple adding)
MEAN LENGTH = 34.38cm N= 3364

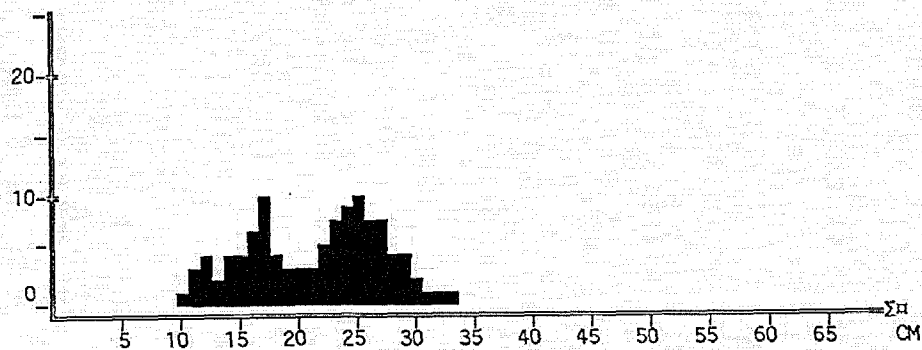


Merluccius capensis
Ambrose Bay - Cunene. 260-600m

Pooled sample (simple adding)
MEAN LENGTH = 40.35cm N= 2139

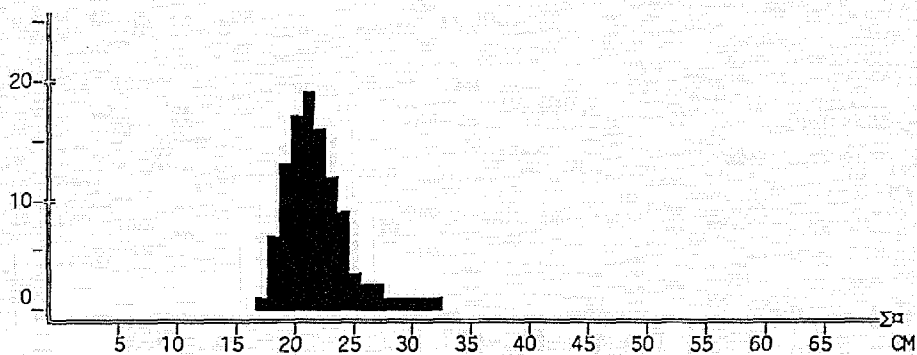


Merluccius capensis
Ambrose Bay - Cunene. Total



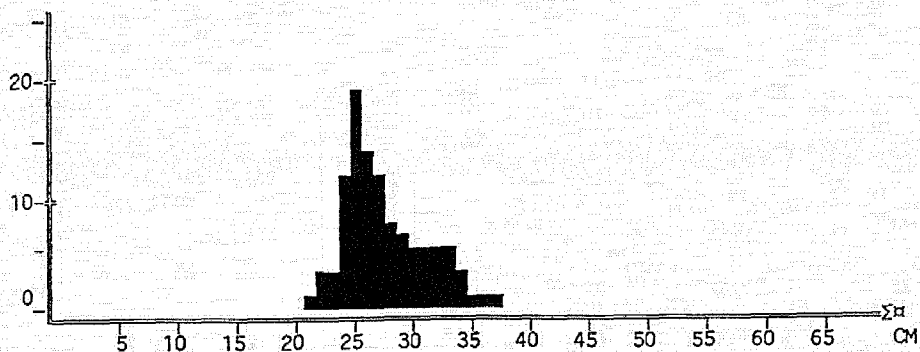
Trachurus capensis
Ambrose Bay - Cunene River

Pooled sample (simple adding)
MEAN LENGTH = 21.38cm N= 1395



Trachurus capensis
St Francis - Ambrose Bay

Pooled sample (simple adding)
MEAN LENGTH = 22.04cm N= 1909
NUMBER OF SUBSAMPLES : 15



Trachurus capensis
Division 1.5

Pooled sample (simple adding)
MEAN LENGTH = 27.46cm N= 769

ANNEX II

DATE: 14/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2828 Long E 1603
 PROJECT STATION: 356
 start stop duration Purpose code: 3
 TIME :09:25:00 09:55:00 30 (min) Area code : 1
 LOG :1885.40 1886.90 1.80 GearCond.code:
 FDEPTH: 74 84 Validity code:
 BDEPTH: 74 84
 Towing dir: 310° Wire out: 350 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 59.77 CATCH/HOUR: 119.54

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP.NO.
Merluccius capensis female	45.70	352	38.23	3
Chelidonichthys capensis	44.00	322	36.81	4
Merluccius capensis male	11.30	94	9.45	2
Krill	10.00		8.37	
Thyrrites atun	4.00	16	3.35	
Lolligonula mercatoris	1.80	400	1.51	
Austroglossus microlepis	1.40	12	1.17	
Squilla sp	0.40	40	0.33	
Sepia australis	0.40	16	0.33	
Janus lalandii	0.30	2	0.25	
Trachurus capensis	0.20	2	0.17	
Engraulis capensis	0.02	4	0.02	
Etrumeus whiteheadi	0.02	4	0.02	
Total	119.54		100.01	

DATE: 14/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2850 Long E 1548
 PROJECT STATION: 360
 start stop duration Purpose code: 2
 TIME :19:27:00 20:07:00 40 (min) Area code : 1
 LOG :1952.30 1954.50 2.20 GearCond.code:
 FDEPTH: 172 174 Validity code:
 BDEPTH: 172 174
 Towing dir: 335° Wire out: 750 m Speed: 34 kn*10

Sorted: 52 Kg Total catch: 157.65 CATCH/HOUR: 236.48

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP.NO.
Merluccius capensis	163.80	2718	69.27	15
Trachurus capensis	38.25	243	16.17	16
Paracallionymus costatus	10.35	644	4.38	
Squilla sp	4.50	293	1.90	
Parapanaxus longirostris	3.36	518	1.43	
Helicolenus dactylopterus	3.15	230	1.33	
Cynoglossus zanzibarensis	3.15	95	1.33	
Holohalaelurus regani	2.25	86	0.95	
Genypterus capensis	2.25	36	0.95	
Coelorinchus fasciatus	1.80	36	0.76	
Thyrrites atun	1.59	5	0.67	
Todaropsis eblanæ	1.13	9	0.48	
Sepia australis	0.36	23	0.15	
Sufflogobius bibarbatu	0.32	2	0.14	
Lepidopus caudatus	0.23	5	0.10	
Total	236.50		100.01	

DATE: 14/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2840 Long E 1614
 PROJECT STATION: 357
 start stop duration Purpose code: 3
 TIME :11:35:00 12:05:00 30 (min) Area code : 1
 LOG :1909.90 1911.30 1.60 GearCond.code:
 FDEPTH: 83 81 Validity code:
 BDEPTH: 83 81
 Towing dir: 322° Wire out: 400 m Speed: 28 kn*10

Sorted: 115 Kg Total catch: 114.80 CATCH/HOUR: 229.60

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP.NO.
Merluccius capensis female	70.00	542	30.49	7
Callorhynchus capensis	50.00	30	21.78	
Krill	36.40		15.85	
Chelidonichthys capensis	29.80	162	12.98	8
Merluccius capensis male	12.40	100	5.40	6
Lolligonula mercatoris	7.80		3.40	
Raja clavata	4.80	2	2.09	
Thyrrites atun	3.90	16	1.70	
Austroglossus microlepis	2.70	20	1.18	
Trachurus capensis	2.00	40	0.87	
Janus lalandii	2.00	16	0.87	
Sufflogobius bibarbatu	1.20	128	0.52	
Squalus acanthias	1.00	8	0.44	
Squilla sp	0.60	28	0.26	
Merluccius capensis juveniles	0.20	26	0.09	5
Engraulis capensis	0.20	16	0.09	
Squalus megalops	0.20	2	0.09	
Total	229.60		100.02	

DATE: 15/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2938 Long E 1442
 PROJECT STATION: 361
 start stop duration Purpose code: 3
 TIME :05:44:00 06:14:00 30 (min) Area code : 1
 LOG :2034.30 2036.00 1.90 GearCond.code:
 FDEPTH: 401 395 Validity code:
 BDEPTH: 401 395
 Towing dir: 335° Wire out: 1200 m Speed: 34 kn*10

Sorted: 12 Kg Total catch: 15.21 CATCH/HOUR: 32.42

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP.NO.
Merluccius paradoxus	23.40	100	72.18	17
Merluccius capensis	3.60	2	11.10	
Malacocephalus laevis	1.60	8	4.94	
Lepidopus caudatus	1.20	4	3.70	
Lampanyctodes hectoris	1.00		3.08	
Parapanaxus longirostris	0.40		1.23	
Holohalaelurus regani	0.30	178	0.93	
Paracallionymus costatus	0.30	12	0.93	
Helicolenus dactylopterus	0.20	8	0.62	
Coelorinchus fasciatus	0.20	12	0.62	
C E P H A L O P O D A	0.10	4	0.31	
C R A B S	0.10	2	0.31	
Squilla sp	0.02	2	0.06	
Total	32.42		100.01	

DATE: 14/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2851 Long E 1602
 PROJECT STATION: 358
 start stop duration Purpose code: 3
 TIME :14:43:00 15:13:00 30 (min) Area code : 1
 LOG :1929.40 1931.00 1.60 GearCond.code:
 FDEPTH: 144 143 Validity code:
 BDEPTH: 144 143
 Towing dir: 320° Wire out: 650 m Speed: 32 kn*10

Sorted: 82 Kg Total catch: 82.02 CATCH/HOUR: 164.04

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP.NO.
Merluccius capensis female	60.00	412	36.58	11
Merluccius capensis juveniles	38.00	584	23.17	9
Merluccius capensis male	28.80	208	17.56	10
Trachurus capensis	20.40	150	12.44	12
Thyrrites atun	7.60	56	4.63	
Sepia australis	4.60	144	2.80	
Cynoglossus zanzibarensis	1.40	30	0.85	
Chelidonichthys capensis	1.20	6	0.73	
Squalus megalops	0.80	2	0.49	
Lolligonula mercatoris	0.60		0.37	
Genypterus capensis	0.20	4	0.12	
Sufflogobius bibarbatu	0.20	118	0.12	
Lepidopus caudatus	0.10	2	0.06	
MYCTOPHIDAE	0.04	60	0.02	
Paracallionymus costatus	0.04	6	0.02	
Squilla sp	0.04	4	0.02	
Coelorinchus fasciatus	0.02	2	0.01	
Helicolenus dactylopterus	0.00	2		
Total	164.04		99.99	

DATE: 15/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2941 Long E 1433
 PROJECT STATION: 362
 start stop duration Purpose code: 3
 TIME :08:05:00 08:35:00 30 (min) Area code : 1
 LOG :2047.50 2048.80 1.45 GearCond.code:
 FDEPTH: 513 507 Validity code:
 BDEPTH: 513 507
 Towing dir: 350° Wire out: 1400 m Speed: 28 kn*10

Sorted: 5 Kg Total catch: 53.00 CATCH/HOUR: 106.00

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP.NO.
Trachyrinus scabrus	34.80	740	32.83	
Raja caudaspinosa	22.00	30	20.75	
Dasyatis sp	15.50	2	14.62	
Merluccius paradoxus	10.00	10	9.43	18
Helicolenus dactylopterus	8.60	36	8.11	
Todaropsis sagittatus	7.00	12	6.60	
MYCTOPHIDAE	2.40	100	2.25	
Malacocephalus laevis	2.20	42	2.05	
Holohalaelurus regani	1.00	4	0.94	
Todaropsis eblanæ	1.00	72	0.94	
MYCTOPHIDAE	0.80	60	0.75	
Rossia sp	0.60	22	0.57	
Lampanyctodes hectoris	0.04	40	0.04	
MYCTOPHIDAE	0.04	20	0.04	
S H R I M P S	0.02	40	0.02	
Total	106.00		99.98	

DATE: 14/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2900 Long E 1549
 PROJECT STATION: 359
 start stop duration Purpose code: 3
 TIME :18:02:00 18:32:00 30 (min) Area code : 1
 LOG :1948.20 1950.00 1.70 GearCond.code:
 FDEPTH: 172 174 Validity code:
 BDEPTH: 172 174
 Towing dir: 335° Wire out: 750 m Speed: 36 kn*10

Sorted: 43 Kg Total catch: 171.60 CATCH/HOUR: 243.20

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP.NO.
Trachurus capensis	162.40	1096	47.32	14
Merluccius capensis	88.00	1800	25.64	13
Paracallionymus costatus	53.60	2544	15.62	
Thyrrites atun	19.20	56	5.59	
Sepia australis	9.60	336	2.80	
Cynoglossus zanzibarensis	4.80	184	1.40	
Lophius species	1.80	8	1.40	
Sufflogobius bibarbatu	0.80		0.23	
Lolligonula mercatoris	0.80		0.23	
Helicolenus dactylopterus	0.80	120	0.23	
Holohalaelurus regani	0.80	24	0.23	
Todaropsis eblanæ	0.40	10	0.12	
Lampanyctodes hectoris	0.32		0.09	
Squilla sp	0.08		0.02	
Total	243.20		99.99	

DATE: 15/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2915 Long E 1430
 PROJECT STATION: 363
 start stop duration Purpose code: 3
 TIME :11:31:00 12:06:00 35 (min) Area code : 1
 LOG :2073.00 2074.30 1.30 GearCond.code:
 FDEPTH: 452 446 Validity code:
 BDEPTH: 452 446
 Towing dir: 356° Wire out: 1250 m Speed: 24 kn*10

Sorted: 104 Kg Total catch: 104.10 CATCH/HOUR: 178.46

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP.NO.
Merluccius paradoxus female	89.49	307	50.15	21
Merluccius paradoxus male	41.14	165	23.05	20
Helicolenus dactylopterus	15.43	89	8.65	
Raja caudaspinosa	7.87	5	4.42	
Genypterus capensis	5.14	2	2.98	
MYCTOPHIDAE	3.77		2.11	
Plesionika sp	3.77		2.11	
Scyllorhinus capensis	2.74	7	1.54	
Coelorinchus fasciatus	1.89	45	1.06	
Todaropsis sagittatus	1.71	2	0.96	
Trachyrinus scabrus	1.27	57	0.77	
Malacocephalus laevis	1.03	9	0.58	
Todaropsis eblanæ	0.86	24	0.48	
Bathypocconger vicinus	0.69	5	0.39	
Nezumia alosis	0.51	33	0.29	
Holohalaelurus regani	0.51	2	0.29	
Psychrolutes macrocephalus	0.34	2	0.19	
Diplophus sp.	0.17	12	0.10	
Paracallionymus costatus	0.00	2		
Total	178.45		100.02	

PROJECT STATION: 364
 DATE: 15/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2913 Long E 1434
 TIME :13:14:00 13:44:00 30 (min) Purpose code: 3
 LOG :2079.70 2081.20 1.50 Area code : 1
 FDEPTH: 352 350 GearCond.code: 1
 BDEPTH: 352 250 Validity code:
 Towing dir: 346° Wire out: 1150 m Speed: 30 kn*10
 Sorted: 83 Kg Total catch: 166.80 CATCH/HOUR: 333.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius paradoxus female	213.20	904	63.91	24
Merluccius paradoxus male	66.40	324	19.90	23
Trachurus capensis	17.60	44	5.28	25
Malacocephalus laevis	9.60	92	2.88	
Galeorhinus fasciatus	8.40	356	2.52	
Holohalaelurus regani	8.00	32	2.40	
Cynoglossus zanzibarensis	2.80	72	0.84	
Todarodes sagittatus	2.00	4	0.60	
Helicolenus dactylopterus	1.20	52	0.36	
Todaropsis eblanae	0.80	36	0.24	
Rossia sp	0.80	36	0.24	
MYCTOPHIDAE	0.40	16	0.12	
Paracallionymus costatus	0.40	36	0.12	
PORTUNIDAE	0.40	16	0.12	
Nezumia leonis	0.08	4	0.02	
Xenodermichthys dagleishi	0.08	4	0.02	
Total	332.16		99.57	

PROJECT STATION: 365
 DATE: 15/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2907 Long E 1432
 TIME :15:42:00 16:12:00 30 (min) Purpose code: 3
 LOG :2092.10 2093.70 1.60 Area code : 1
 FDEPTH: 290 293 GearCond.code: 1
 BDEPTH: 290 292 Validity code:
 Towing dir: 340° Wire out: 1000 m Speed: 32 kn*10
 Sorted: 92 Kg Total catch: 540.25 CATCH/HOUR: 1080.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachurus capensis	470.80	1586	43.97	26
Merluccius paradoxus	456.50	5986	42.25	27
Thyrssites atun	48.60	36	4.50	28
Todarodes sagittatus	34.10	44	3.16	
Malacocephalus laevis	25.30	638	2.34	
Lophius upsicephalus	16.40	4	1.52	
Cynoglossus zanzibarensis	11.00	176	1.02	
Rossia sp	6.60	242	0.61	
Holohalaelurus regani	5.50	22	0.51	
Galeorhinus fasciatus	3.30	122	0.31	
MYCTOPHIDAE	1.10	352	0.10	
Paracallionymus costatus	1.10	132	0.10	
Helicolenus dactylopterus	0.20	34	0.02	
Total	1080.50		100.01	

PROJECT STATION: 366
 DATE: 15/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2903 Long E 1448
 TIME :18:19:00 18:49:00 30 (min) Purpose code: 3
 LOG :2111.40 2113.00 1.74 Area code : 1
 FDEPTH: 212 206 GearCond.code: 1
 BDEPTH: 212 206 Validity code:
 Towing dir: 340° Wire out: 850 m Speed: 32 kn*10
 Sorted: 111 Kg Total catch: 2009.50 CATCH/HOUR: 4019.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachurus capensis	3427.20	19958	85.27	29
Merluccius capensis juveniles	252.00	5350	6.27	32
Merluccius capensis	136.60	220	3.40	31
Emmelichthys nitidus	32.00	320	0.80	
Galeorhinus galeus	32.00	2	0.80	
Thyrssites atun	31.00	18	0.77	30
Galeorhinus capensis	29.80	4	0.74	
Chelidonichthys queketti	28.80	128	0.72	
Sepia australis	12.80	1312	0.32	
Cynoglossus zanzibarensis	12.80	160	0.32	
Helicolenus dactylopterus	9.60	160	0.24	
Holohalaelurus regani	6.40	32	0.16	
Zeus faber	6.40	26	0.16	
Trichurus lepturus	6.40	64	0.16	
Paracallionymus costatus	3.20	288	0.08	
Todaropsis eblanae	3.20	32	0.08	
CONGRIDAE	1.60	32	0.04	
Total	4031.80		100.33	

PROJECT STATION: 367
 DATE: 15/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2852 Long E 1507
 TIME :21:55:00 22:53:00 58 (min) Purpose code: 2
 LOG :2136.00 2139.20 3.10 Area code : 1
 FDEPTH: 164 166 GearCond.code: 1
 BDEPTH: 164 166 Validity code:
 Towing dir: 340° Wire out: 650 m Speed: 33 kn*10
 Sorted: 48 Kg Total catch: 169.89 CATCH/HOUR: 175.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis	125.28	200	71.28	33
Cynoglossus zanzibarensis	12.67	142	7.21	
Helicolenus dactylopterus	9.20	434	5.23	
Holohalaelurus regani	7.97	29	4.53	
Paracallionymus costatus	5.43	543	3.09	
Trachurus capensis	4.71	26	2.68	
SQUALIDAE	4.34	11	2.47	
Zeus faber	1.81	33	1.03	
Aristeus varidens	1.81	217	1.03	
Genypterus capensis	1.45	10	0.83	
Lophius upsicephalus	0.72	4	0.41	
Malacocephalus laevis	0.36	4	0.20	
Total	175.75		95.92	

PROJECT STATION: 368
 DATE: 16/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2853 Long E 1507
 TIME :06:44:00 07:14:00 30 (min) Purpose code: 3
 LOG :2151.60 2153.00 1.70 Area code : 1
 FDEPTH: 164 164 GearCond.code: 1
 BDEPTH: 164 164 Validity code:
 Towing dir: 340° Wire out: 650 m Speed: 28 kn*10
 Sorted: 51 Kg Total catch: 210.93 CATCH/HOUR: 421.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis male	131.20	166	31.10	36
Merluccius capensis female	89.00	108	20.86	35
Helicolenus dactylopterus	53.40	2130	12.66	34
Chelidonichthys queketti	38.40	96	9.10	
Raja clavata	23.40	10	5.55	
Trachurus capensis	21.80	118	5.17	
Paracallionymus costatus	16.00	1600	3.79	
Lophius upsicephalus	10.60	10	2.51	
Cynoglossus zanzibarensis	8.20	170	1.94	
Squalus megalops	8.00	22	1.90	
Holohalaelurus regani	6.40	26	1.22	
Sepia australis	5.60	30	1.07	
Thyrssites atun	5.40	6	1.25	
Zeus faber	2.80	118	0.66	
Etrumeus whiteheadi	0.60	6	0.14	
Sufflogobius bibarbatu	0.60	122	0.14	
CONGRIDAE	0.60	22	0.14	
Congilopodus spinifer	0.60	6	0.14	
Genypterus capensis	0.60	6	0.01	
Total	421.86		99.98	

PROJECT STATION: 369
 DATE: 16/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2841 Long E 1527
 TIME :09:40:00 10:10:00 30 (min) Purpose code: 3
 LOG :2174.80 2176.50 1.74 Area code : 1
 FDEPTH: 182 181 GearCond.code: 1
 BDEPTH: 182 181 Validity code:
 Towing dir: 65° Wire out: 750 m Speed: 34 kn*10
 Sorted: 84 Kg Total catch: 251.85 CATCH/HOUR: 503.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachurus capensis	233.40	1254	46.34	
Merluccius capensis male	80.40	216	15.96	38
Merluccius capensis female	51.60	138	10.24	39
Merluccius capensis juveniles	51.00	1494	10.13	37
Paracallionymus costatus	27.00	2100	5.36	
Helicolenus dactylopterus	27.00	2154	5.36	
Holohalaelurus regani	7.20	60	1.43	
Sepia australis	3.00	300	0.66	
Squilla sp	3.00	102	0.60	
Squalus megalops	3.00	6	0.60	
Genypterus capensis	3.00	30	0.60	
Thyrssites atun	3.00	12	0.60	
Lophius upsicephalus	3.00	12	0.60	
Sufflogobius bibarbatu	2.40	900	0.48	
Chelidonichthys capensis	1.80	6	0.26	
Lepidopus caudatus	1.20	18	0.24	
CONGRIDAE	0.60	18	0.12	
Todaropsis eblanae	0.60	54	0.12	
Cynoglossus zanzibarensis	0.60	18	0.12	
Malacocephalus laevis	0.60	18	0.12	
Total	503.70		100.64	

PROJECT STATION: 370
 DATE: 16/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2836 Long E 1537
 TIME :11:26:00 11:56:00 30 (min) Purpose code: 3
 LOG :2185.80 2188.30 1.70 Area code : 1
 FDEPTH: 162 160 GearCond.code: 1
 BDEPTH: 162 160 Validity code:
 Towing dir: 326° Wire out: 650 m Speed: 30 kn*10
 Sorted: 54 Kg Total catch: 225.10 CATCH/HOUR: 450.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	224.00	884	49.76	42
Merluccius capensis juveniles	95.20	2476	21.15	40
Trachurus capensis	50.40	344	11.20	20
Merluccius capensis male	40.00	248	8.88	41
Octopus vulgaris	12.40	2	2.75	
Chelidonichthys capensis	9.60	40	2.13	
Sepia australis	3.20	128	0.71	
Squilla sp	3.20	144	0.71	
Thyrssites atun	2.60	4	0.58	
Cynoglossus zanzibarensis	2.40	40	0.53	
Genypterus capensis	2.40	8	0.53	
Helicolenus dactylopterus	1.60	104	0.36	
Galeorhinus fasciatus	1.60	24	0.36	
Sufflogobius bibarbatu	1.20	480	0.27	
Lepidopus caudatus	0.40	8	0.09	
Lolligoncula mercatoris	0.00	40		
Total	450.20		100.01	

PROJECT STATION: 371
 DATE: 16/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2817 Long E 1522
 TIME :14:01:00 14:31:00 30 (min) Purpose code: 3
 LOG :2209.50 2210.97 1.63 Area code : 1
 FDEPTH: 143 136 GearCond.code: 1
 BDEPTH: 143 136 Validity code:
 Towing dir: 338° Wire out: 600 m Speed: 30 kn*10
 Sorted: 174 Kg Total catch: 174.56 CATCH/HOUR: 349.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachurus capensis	155.40	1070	44.80	44
Merluccius capensis female	68.80	494	19.71	47
Thyrssites atun	52.20	154	14.95	43
Merluccius capensis male	33.40	294	9.57	46
Galeorhinus galeus	30.00	2	8.59	
Merluccius capensis juveniles	3.20	60	0.92	45
Lolligoncula mercatoris	1.80	1	0.52	
Sufflogobius bibarbatu	1.60	1	0.46	
Lepidopus caudatus	0.60	12	0.17	
Todaropsis eblanae	0.20	4	0.06	
Cynoglossus zanzibarensis	0.20	2	0.06	
Etrumeus whiteheadi	0.20	2	0.06	
CONGRIDAE	0.20	10	0.06	
Zeus faber	0.20	2	0.06	
Sepia australis	0.10	4	0.03	
Squilla sp	0.02	4	0.01	
Total	349.12		100.03	

PROJECT STATION: 372
 DATE: 16/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2025 Long E 1506
 start stop duration Purpose code: 3
 TIME :16:18:00 16:48:00 30 (min) Area code : 1
 LOG :2227.90 2229.50 1.60 GearCond.code:
 FDEPTH: 175 172 Validity code:
 BDEPTH: 175 172
 Towing dir: 232° Wire out: 750 m Speed: 32 kn*10
 Sorted: 99 Kg Total catch: 249.20 CATCH/HOUR: 498.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
weight	numbers		
Merluccius capensis female	292.00	780	58.59
Etrumeus whiteheadi	114.00	765	22.87
Merluccius capensis male	52.80	304	10.19
Thyrssites atun	30.60	40	6.44
Helicolenus dactylopterus	2.40	28	0.48
Squalus megalops	1.80	4	0.36
Zeus faber	1.60	48	0.32
Loligo vulgaris	1.40	16	0.28
Holohalaelurus regani	1.00	4	0.20
Congiopodus spinifer	0.40	4	0.08
Sepia australis	0.40	20	0.08
Todaropsis eblanae	0.04	4	0.01
Total	498.44		100.00

PROJECT STATION: 373
 DATE: 16/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2832 Long E 1453
 start stop duration Purpose code: 3
 TIME :18:15:00 18:45:00 30 (min) Area code : 1
 LOG :2242.40 2244.20 1.70 GearCond.code:
 FDEPTH: 181 184 Validity code:
 BDEPTH: 181 184
 Towing dir: 240° Wire out: 750 m Speed: 36 kn*10
 Sorted: 122 Kg Total catch: 272.50 CATCH/HOUR: 545.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
weight	numbers		
Merluccius capensis female	204.80	654	37.58
Thyrssites atun	110.00	66	20.18
Merluccius capensis male	89.00	522	16.23
Paracallionymus costatus	49.00	5850	8.99
Merluccius capensis juveniles	35.20	1082	6.46
Etrumeus whiteheadi	29.80	330	1.47
Sepia australis	8.00	682	5.62
Chelidonichthys capensis	3.20	6	0.59
Holohalaelurus regani	3.20	16	0.59
Lophius upsicephalus	2.60	10	0.48
Cynoglossus zanzibarensis	2.60	38	0.48
Zeus faber	2.60	42	0.48
Trachurus capensis	1.60	10	0.29
Helicolenus dactylopterus	1.60	144	0.29
Sufflogobius bibarbatu	0.60	112	0.11
Lepidopus caudatus	0.60	16	0.11
Todaropsis eblanae	0.60	150	0.11
Total	545.00		100.01

PROJECT STATION: 374
 DATE: 16/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2854 Long E 1426
 start stop duration Purpose code: 3
 TIME :23:20:00 23:50:00 30 (min) Area code : 1
 LOG :2282.10 2284.10 1.60 GearCond.code:
 FDEPTH: 349 352 Validity code:
 BDEPTH: 349 352
 Towing dir: 355° Wire out: 1050 m Speed: 40 kn*10
 Sorted: 51 Kg Total catch: 51.30 CATCH/HOUR: 102.60

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
weight	numbers		
Merluccius paradoxus female	46.80	58	45.61
Etrumeus lucifer	17.20	138	16.76
Gonypterus capensis	16.80	6	15.37
Coelorhynchus fasciatus	5.00	92	4.87
Epigonus pandionis	4.60	74	4.48
Holohalaelurus regani	4.00	20	3.90
Cynoglossus zanzibarensis	3.20	44	3.12
Merluccius paradoxus male	2.60	12	2.53
Deania calcea	1.00	2	0.97
Helicolenus dactylopterus	0.80	12	0.78
MYCTOPHIDAE	0.40	0	0.39
Paracallionymus costatus	0.20	8	0.19
Total	102.60		99.97

PROJECT STATION: 375
 DATE: 17/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2815 Long E 1428
 start stop duration Purpose code: 3
 TIME :06:54:00 07:24:00 30 (min) Area code : 1
 LOG :2341.80 2343.30 1.50 GearCond.code:
 FDEPTH: 452 455 Validity code:
 BDEPTH: 452 455
 Towing dir: 25° Wire out: 1350 m Speed: 30 kn*10
 Sorted: 19 Kg Total catch: 28.95 CATCH/HOUR: 57.90

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
weight	numbers		
Lampanyctodes hectoris	54.00		93.26
Merluccius paradoxus	1.80	4	3.11
Todaropsis eblanae	1.50	72	2.59
Cynoglossus zanzibarensis	0.60	6	1.04
Total	57.90		100.00

PROJECT STATION: 376
 DATE: 17/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2814 Long E 1431
 start stop duration Purpose code: 3
 TIME :08:35:00 09:05:00 30 (min) Area code : 1
 LOG :2349.80 2351.40 1.50 GearCond.code:
 FDEPTH: 350 355 Validity code:
 BDEPTH: 350 355
 Towing dir: 75° Wire out: 1050 m Speed: 32 kn*10
 Sorted: 259 Kg Total catch: 402.60 CATCH/HOUR: 865.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
weight	numbers		
Thyrssites atun	402.40	254	46.51
Merluccius paradoxus male	164.00	374	19.02
Merluccius paradoxus female	156.40	448	18.08
Lampanyctodes hectoris	43.60		5.04
Merluccius paradoxus juveniles	43.60	584	5.04
Trachurus capensis	28.60	54	3.31
Scyliorhinus capensis	18.36	20	2.12
Malacocephalus laevis	6.20	20	0.72
Holohalaelurus regani	1.40	6	0.16
Total	865.16		100.00

PROJECT STATION: 377
 DATE: 17/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2813 Long E 1437
 start stop duration Purpose code: 3
 TIME :10:22:00 11:07:00 35 (min) Area code : 1
 LOG :2362.30 2363.80 1.60 GearCond.code:
 FDEPTH: 196 228 Validity code:
 BDEPTH: 196 328
 Towing dir: 330° Wire out: 750 m Speed: 30 kn*10
 Sorted: 68 Kg Total catch: 386.10 CATCH/HOUR: 661.89

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
weight	numbers		
Thyrssites atun	317.49	297	47.97
Merluccius capensis female	156.34	502	23.62
Merluccius capensis male	116.57	489	17.61
Galeorhinus galeus	32.57		4.92
Chelidonichthys queketti	23.31	41	3.52
Todarodes sagittatus	7.37	74	1.11
Congiopodus spinifer	6.00	5	0.91
Trachurus capensis	2.23	9	0.34
Total	661.88		100.00

PROJECT STATION: 378
 DATE: 17/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2807 Long E 1456
 start stop duration Purpose code: 3
 TIME :13:45:00 14:15:00 30 (min) Area code : 1
 LOG :2384.20 2385.70 1.80 GearCond.code:
 FDEPTH: 198 193 Validity code:
 BDEPTH: 188 193
 Towing dir: 334° Wire out: 750 m Speed: 30 kn*10
 Sorted: 136 Kg Total catch: 136.50 CATCH/HOUR: 273.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
weight	numbers		
Merluccius capensis female	150.00	636	54.95
Trachurus capensis	60.00	218	21.98
Merluccius capensis male	35.40	216	12.97
Thyrssites atun	12.20	4	4.47
Etrumeus whiteheadi	9.00	142	3.30
Lepidopus caudatus	6.20	210	2.27
Loligo vulgaris	0.10	2	0.04
Baerelichthys nitidus	0.10	2	0.04
Total	273.00		100.02

PROJECT STATION: 379
 DATE: 17/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2800 Long E 1513
 start stop duration Purpose code: 3
 TIME :19:07:00 19:37:00 30 (min) Area code : 1
 LOG :2418.50 2419.80 1.30 GearCond.code:
 FDEPTH: 155 150 Validity code:
 BDEPTH: 155 150
 Towing dir: 340° Wire out: 750 m Speed: 26 kn*10
 Sorted: 29 Kg Total catch: 51.16 CATCH/HOUR: 122.32

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
weight	numbers		
Merluccius capensis	92.80	618	75.87
Gonypterus capensis	12.00	12	9.81
Callorhynchus capensis	8.00	2	6.54
Sufflogobius bibarbatu	4.00	704	4.27
Thyrssites atun	2.60	4	2.13
Etrumeus whiteheadi	2.00	32	1.64
Chelidonichthys capensis	0.40	4	0.23
Lepidopus caudatus	0.32	28	0.26
Lampanyctodes hectoris	0.20	48	0.16
Sepia australis	0.20	6	0.16
Loligo vulgaris	0.04	6	0.03
Squilla sp	0.04	4	0.03
Total	122.60		100.23

PROJECT STATION: 380
 DATE: 18/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2741 Long E 1438
 start stop duration Purpose code: 3
 TIME :05:21:00 05:51:00 30 (min) Area code : 1
 LOG :2500.40 2501.90 1.70 GearCond.code:
 FDEPTH: 392 392 Validity code:
 BDEPTH: 392 392
 Towing dir: 340° Wire out: 1150 m Speed: 30 kn*10
 Sorted: Kg Total catch: 8.71 CATCH/HOUR: 17.42

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
weight	numbers		
MYCTOPHIDAE	7.40		42.48
Merluccius paradoxus	5.00	18	28.70
Thyrssites atun	3.20	2	18.37
Trachurus capensis	1.20	6	6.89
Lepidopus caudatus	0.40	8	2.30
Loligo vulgaris	0.20	6	1.15
Sufflogobius bibarbatu	0.02	10	0.11
Total	17.42		100.00

PROJECT STATION: 381
 DATE: 18/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2738 Long E 1443
 start stop duration Purpose code: 3
 TIME :07:25:00 07:55:00 30 (min) Area code : 1
 LOG :2511.60 2513.00 1.70 GearCond.code:
 FDEPTH: 350 347 Validity code:
 BDEPTH: 350 347
 Towing dir: 315° Wire out: 1050 m Speed: 26 kn*10
 Sorted: 80 Kg Total catch: 85.11 CATCH/HOUR: 170.22

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
weight	numbers		
Thyrssites atun	128.80	92	75.67
Merluccius paradoxus	32.00	110	18.80
Lampanyctodes hectoris	4.20		2.47
Todarodes sagittatus	4.00	4	2.35
Beryx splendens	0.40	2	0.23
Helicolenus dactylopterus	0.20	6	0.12
Paracallionymus costatus	0.20	4	0.12
Lycoteuthis diadema	0.02	2	0.01
Total	169.82		99.77

PROJECT STATION: 382
 DATE: 18/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2721 Long E 1457
 start stop duration
 TIME :10:23:00 10:53:00 30 (min) Purpose code: 3
 LOG :2531.70 2533.30 2.00 Area code : 1
 FDEPTH: 254 247 GearCond.code:
 BDEPTH: 254 247 Validity code:
 Towing dir: 360° Wire out: 1000 m Speed: 32 kn*10
 Sorted: 48 Kg Total catch: 320.70 CATCH/HOUR: 641.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis	630.00	98.22	73
Sufflogobius bibarbatatus	5.40	0.84	
Todarodes sagittatus	2.40	0.37	
Holohalaelurus regani	1.60	0.28	
Leapanactodes hectoris	1.20	0.19	
Lepidopus caudatus	0.60	0.09	
Total	641.40	99.99	

PROJECT STATION: 383
 DATE: 18/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2719 Long E 1501
 start stop duration
 TIME :13:10:00 13:40:00 30 (min) Purpose code: 3
 LOG :2544.40 2545.90 1.90 Area code : 1
 FDEPTH: 177 170 GearCond.code:
 BDEPTH: 177 170 Validity code:
 Towing dir: 340° Wire out: 750 m Speed: 30 kn*10
 Sorted: 26 Kg Total catch: 121.10 CATCH/HOUR: 242.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis	213.00	87.94	74
Sufflogobius bibarbatatus	15.00	6.19	
Callorhynchus capensis	6.20	2.56	
Trachurus capensis	6.00	2.48	
Lolliguncula mercatoris	2.00	0.83	
Total	242.20	100.00	

PROJECT STATION: 384
 DATE: 18/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2711 Long E 1503
 start stop duration
 TIME :15:04:00 15:34:00 30 (min) Purpose code: 3
 LOG :2553.30 2554.90 2.00 Area code : 1
 FDEPTH: 154 155 GearCond.code:
 BDEPTH: 154 155 Validity code:
 Towing dir: 340° Wire out: 450 m Speed: 32 kn*10
 Sorted: 56 Kg Total catch: 56.20 CATCH/HOUR: 112.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
MYCTOPHIDAE	54.00	48.75	
Merluccius capensis	50.00	44.48	
Trachurus capensis	3.80	3.38	
Callorhynchus capensis	3.00	2.67	
Lepidopus caudatus	0.80	0.71	
Total	112.40	99.99	

PROJECT STATION: 385
 DATE: 18/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2701 Long E 1450
 start stop duration
 TIME :17:54:00 18:24:00 30 (min) Purpose code: 3
 LOG :2568.40 2569.90 2.10 Area code : 1
 FDEPTH: 199 198 GearCond.code:
 BDEPTH: 199 198 Validity code:
 Towing dir: 338° Wire out: 800 m Speed: 30 kn*10
 Sorted: 35 Kg Total catch: 141.90 CATCH/HOUR: 283.80

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis	176.00	62.02	75
MYCTOPHIDAE	97.60	34.39	
Trachurus capensis	7.60	2.68	
Lepidopus caudatus	2.60	0.92	
Total	283.80	100.01	

PROJECT STATION: 386
 DATE: 19/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2656 Long E 1440
 start stop duration
 TIME :07:16:00 07:46:00 30 (min) Purpose code: 3
 LOG :2603.60 2605.30 1.90 Area code : 1
 FDEPTH: 250 250 GearCond.code:
 BDEPTH: 250 250 Validity code:
 Towing dir: 340° Wire out: 1000 m Speed: 34 kn*10
 Sorted: 87 Kg Total catch: 231.80 CATCH/HOUR: 463.60

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	140.00	30.20	78
Merluccius capensis male	116.00	25.92	77
Sufflogobius bibarbatatus	97.20	20.97	76
Merluccius capensis juveniles	92.00	19.84	79
Trachurus capensis	11.60	2.50	
Squilla sp	3.20	0.69	
Lepidopus caudatus	1.60	0.35	
Lophius upsicephalus	1.20	0.26	
Austroglossus microlepis	0.40	0.09	
Malacocephalus laevis	0.40	0.09	
Total	463.60	100.01	

PROJECT STATION: 387
 DATE: 19/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2647 Long E 1420
 start stop duration
 TIME :10:14:00 10:44:00 30 (min) Purpose code: 3
 LOG :2624.90 2626.60 1.64 Area code : 1
 FDEPTH: 352 350 GearCond.code:
 BDEPTH: 352 350 Validity code:
 Towing dir: 345° Wire out: 1050 m Speed: 34 kn*10
 Sorted: 95 Kg Total catch: 244.35 CATCH/HOUR: 468.70

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius paradoxus	475.60	97.32	80
Todaropsis eblanæ	8.60	1.76	
MYCTOPHIDAE	1.00	0.20	
Helicolenus dactylopterus	1.00	0.20	
Parapenaeus longirostris	1.00	0.20	
Sufflogobius bibarbatatus	1.00	0.20	
Malacocephalus laevis	0.50	0.10	
Total	488.70	99.98	

PROJECT STATION: 388
 DATE: 19/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2635 Long E 1440
 start stop duration
 TIME :13:26:00 13:56:00 30 (min) Purpose code: 3
 LOG :2649.20 2650.90 1.78 Area code : 1
 FDEPTH: 212 212 GearCond.code:
 BDEPTH: 212 212 Validity code:
 Towing dir: 343° Wire out: 800 m Speed: 34 kn*10
 Sorted: 32 Kg Total catch: 576.40 CATCH/HOUR: 1152.80

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	590.40	51.21	83
Merluccius capensis male	504.00	43.72	82
Merluccius capensis juveniles	43.20	3.75	81
Trachurus capensis	7.20	0.62	
Todarodes sagittatus	3.00	0.28	
Callorhynchus capensis	3.00	0.26	
Austroglossus microlepis	2.00	0.17	
Total	1152.80	99.99	

PROJECT STATION: 389
 DATE: 19/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2630 Long E 1436
 start stop duration
 TIME :16:20:00 16:50:00 30 (min) Purpose code: 3
 LOG :2673.00 2674.60 1.60 Area code : 1
 FDEPTH: 250 250 GearCond.code:
 BDEPTH: 250 250 Validity code:
 Towing dir: 343° Wire out: 900 m Speed: 32 kn*10
 Sorted: 87 Kg Total catch: 442.80 CATCH/HOUR: 885.60

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	525.00	59.28	85
Merluccius capensis male	263.00	29.70	86
MYCTOPHIDAE	29.00	3.27	
Todarodes sagittatus	18.00	2.03	
Merluccius capensis juveniles	17.00	1.92	84
Sufflogobius bibarbatatus	11.00	1.24	
Trachurus capensis	10.00	1.13	
Callorhynchus capensis	6.00	0.68	
Lophius upsicephalus	3.60	0.41	
Lepidopus caudatus	3.00	0.34	
Total	885.60	100.00	

PROJECT STATION: 390
 DATE: 19/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2618 Long E 1420
 start stop duration
 TIME :18:40:00 19:10:00 30 (min) Purpose code: 3
 LOG :2691.20 2692.70 1.80 Area code : 1
 FDEPTH: 252 239 GearCond.code:
 BDEPTH: 252 239 Validity code:
 Towing dir: 330° Wire out: 900 m Speed: 30 kn*10
 Sorted: 4 Kg Total catch: 26.30 CATCH/HOUR: 52.60

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis	17.00	42.89	87
Sufflogobius bibarbatatus	17.00	39.57	
Lepidopus caudatus	4.30	8.27	
Trachurus capensis	3.30	6.27	
MYCTOPHIDAE	2.40	4.56	
Todaropsis eblanæ	2.00	3.80	
Shrimps, small, non comm.	0.60	1.14	
Squilla sp	0.60	1.14	
Total	52.60	99.99	

PROJECT STATION: 391
 DATE: 19/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2610 Long E 1404
 start stop duration
 TIME :21:18:00 21:50:00 32 (min) Purpose code: 3
 LOG :2708.70 2710.30 1.60 Area code : 1
 FDEPTH: 350 350 GearCond.code:
 BDEPTH: 350 350 Validity code:
 Towing dir: 342° Wire out: 1050 m Speed: 32 kn*10
 Sorted: 61 Kg Total catch: 284.00 CATCH/HOUR: 532.50

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	249.94	46.94	89
Merluccius capensis male	99.94	18.77	90
Todaropsis eblanæ	99.94	18.77	
Merluccius paradoxus	31.31	5.88	88
Shrimps, small, non comm.	24.38	4.58	
Trachurus capensis	8.12	1.51	
MYCTOPHIDAE	8.06	1.51	
Hoplostethus cadenati	4.88	0.92	
Helicolenus dactylopterus	4.69	0.88	
Malacocephalus laevis	1.26	0.24	
Total	532.52	100.01	

PROJECT STATION: 392
 DATE: 20/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2548 Long E 1340
 start stop duration
 TIME :05:28:00 06:01:00 33 (min) Purpose code: 3
 LOG :2767.20 2768.90 1.66 Area code : 1
 FDEPTH: 454 453 GearCond.code:
 BDEPTH: 454 453 Validity code:
 Towing dir: 347° Wire out: 1200 m Speed: 32 kn*10
 Sorted: Kg Total catch: 8.60 CATCH/HOUR: 15.64

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
MYCTOPHIDAE	5.82	37.21	
Hoplostethus cadenati	4.18	26.73	
Schedophilus huttoni	2.36	15.09	
Merluccius paradoxus	1.45	9.27	
Todaropsis eblanæ	0.91	5.82	
Lycoteuthis diadema	0.36	2.30	
Picisionia sp	0.18	1.15	
Malacocephalus laevis	0.18	1.15	
Selachophidium guentheri	0.09	0.58	
Aphanopus sp	0.09	0.58	
Total	15.62	99.88	

PROJECT STATION: 393
 DATE: 20/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2549 Long E 1351
 start stop duration Purpose code: 3
 TIME :06:44:00 09:14:00 30 (min) Area code : 1
 LOG :2785.30 2706.00 1.50 GearCond.code:
 FDEPTH: 350 348 Validity code:
 BDEPTH: 350 348
 Towing dir: 352° Wire out:1050 m Speed: 30 kn*10
 Sorted: 115 Kg Total catch: 341.35 CATCH/HOUR: 682.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	375.20	752	54.96	93
Merluccius capensis male	146.60	360	21.47	92
Todaropsis eblanae	54.20	154	7.94	
Helicolenus dactylopterus	47.40	136	6.94	
MYCTOPHIDAE	30.00		4.39	
Merluccius paradoxus	17.20	46	2.52	91
Schedophilus huttoni	4.20	2	0.62	
Scyllorhinus capensis	2.80	24	0.41	
Lepidopus caudatus	1.64	10	0.24	
Halargyreus laevis	1.64	18	0.24	
HALIIDE	1.06	2	0.16	
Hoplostethus medonati	0.56	14	0.08	
C R A B S	0.20	4	0.03	
Total	682.70		100.00	

PROJECT STATION: 398
 DATE: 21/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2510 Long E 1339
 start stop duration Purpose code: 3
 TIME :04:02:00 04:32:00 30 (min) Area code : 1
 LOG :2927.30 2928.70 1.50 GearCond.code:
 FDEPTH: 404 400 Validity code:
 BDEPTH: 404 400
 Towing dir: 360° Wire out:1150 m Speed: 28 kn*10
 Sorted: 27 Kg Total catch: 202.20 CATCH/HOUR: 404.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Hoplostethus mediterraneus	251.40		62.66	
Todarodes sagittatus	98.00	308	24.23	
Nezumia leonia	15.40	238	3.81	
Merluccius capensis	13.00	18	3.21	102
Merluccius paradoxus	10.60	22	2.62	103
Lophius upsicephalus	4.20	14	1.04	
Helicolenus dactylopterus	2.80	14	0.69	
Selachophidium guentheri	2.80	84	0.69	
Galeus polli	2.80	28	0.69	
Yarella blackfordi	0.70	28	0.17	
Diplophus maderensis	0.70	56	0.17	
Total	404.40		99.98	

PROJECT STATION: 394
 DATE: 20/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2549 Long E 1408
 start stop duration Purpose code: 3
 TIME :11:58:00 12:31:00 33 (min) Area code : 1
 LOG :2806.70 2808.30 1.60 GearCond.code:
 FDEPTH: 250 247 Validity code:
 BDEPTH: 250 247
 Towing dir: 345° Wire out:1000 m Speed: 31 kn*10
 Sorted: 86 Kg Total catch: 487.00 CATCH/HOUR: 885.45

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	474.91	1885	53.63	95
Merluccius capensis male	355.45	1813	40.14	94
Todarodes sagittatus	21.64	42	2.44	
Sufflogobius bibarbatu	15.45		1.74	
Trachurus capensis	8.18	20	0.92	
MYCTOPHIDAE	6.18		0.70	
Lepidopus caudatus	3.09	11	0.35	
Galeus polli	0.55	2	0.06	
Total	885.45		99.98	

PROJECT STATION: 399
 DATE: 21/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2520 Long E 1346
 start stop duration Purpose code: 3
 TIME :06:47:00 07:17:00 30 (min) Area code : 1
 LOG :2939.20 2940.70 1.40 GearCond.code:
 FDEPTH: 310 309 Validity code:
 BDEPTH: 310 309
 Towing dir: 340° Wire out:1050 m Speed: 30 kn*10
 Sorted: 91 Kg Total catch: 411.70 CATCH/HOUR: 823.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	505.40	1026	61.38	105
Merluccius capensis male	216.00	612	26.23	106
Merluccius paradoxus	50.00	118	7.04	104
Halargyreus laevis	13.60	378	1.65	
S H R I M P S	8.20		1.00	
MYCTOPHIDAE	8.20		1.00	
Todaropsis eblanae	7.20	28	0.87	
Helicolenus dactylopterus	3.20	82	0.59	
Galeus polli	1.80	18	0.22	
Notacanthus sexspinis	0.90	18	0.11	
Squilla sp	0.90	28	0.11	
Total	823.40		100.00	

PROJECT STATION: 395
 DATE: 20/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2549 Long E 1423
 start stop duration Purpose code: 3
 TIME :14:49:00 15:19:00 30 (min) Area code : 1
 LOG :2823.60 2825.10 1.66 GearCond.code:
 FDEPTH: 200 190 Validity code:
 BDEPTH: 200 190
 Towing dir: 90° Wire out: 800 m Speed: 30 kn*10
 Sorted: 55 Kg Total catch: 137.90 CATCH/HOUR: 275.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	120.00	610	43.51	97
Merluccius capensis male	106.00	750	38.43	96
MYCTOPHIDAE	22.40		8.12	
Todarodes sagittatus	10.00	30	3.63	
Sufflogobius bibarbatu	9.60		3.48	
Trachurus capensis	4.60	20	1.67	
Lepidopus caudatus	3.20	16	1.16	
Total	275.80		100.00	

PROJECT STATION: 400
 DATE: 21/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2518 Long E 1352
 start stop duration Purpose code: 3
 TIME :08:30:00 09:00:00 30 (min) Area code : 1
 LOG :2949.70 2951.40 1.60 GearCond.code:
 FDEPTH: 250 247 Validity code:
 BDEPTH: 250 247
 Towing dir: 350° Wire out:1000 m Speed: 34 kn*10
 Sorted: 101 Kg Total catch: 580.25 CATCH/HOUR: 1160.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	633.60	2404	54.59	108
Merluccius capensis male	462.20	1956	39.82	107
Merluccius paradoxus	51.20	218	4.41	
Todaropsis eblanae	9.20	24	0.79	
Sufflogobius bibarbatu	3.00	208	0.26	
Lepidopus caudatus	1.50	24	0.13	
Total	1160.70		100.00	

PROJECT STATION: 396
 DATE: 20/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2549 Long E 1437
 start stop duration Purpose code: 3
 TIME :17:11:00 17:41:00 30 (min) Area code : 1
 LOG :2837.70 2839.40 1.70 GearCond.code:
 FDEPTH: 152 147 Validity code:
 BDEPTH: 152 147
 Towing dir: 353° Wire out: 650 m Speed: 34 kn*10
 Sorted: 56 Kg Total catch: 153.20 CATCH/HOUR: 306.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	194.00	1310	63.32	98
Merluccius capensis male	86.00	736	28.07	99
Chelidonichthys capensis	13.80	40	4.50	
Sufflogobius bibarbatu	8.00	2300	2.61	
Trachurus capensis	3.20	16	1.04	
Lepidopus caudatus	1.40	16	0.46	
Total	306.40		100.00	

PROJECT STATION: 401
 DATE: 21/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2519 Long E 1409
 start stop duration Purpose code: 3
 TIME :11:14:00 11:44:00 30 (min) Area code : 1
 LOG :2971.40 2973.00 1.50 GearCond.code:
 FDEPTH: 197 197 Validity code:
 BDEPTH: 197 197
 Towing dir: 360° Wire out: 800 m Speed: 32 kn*10
 Sorted: 85 Kg Total catch: 720.80 CATCH/HOUR: 1441.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	843.40	2934	58.50	110
Merluccius capensis male	595.00	3066	41.27	109
MYCTOPHIDAE	1.60		0.11	
Sufflogobius bibarbatu	1.60		0.11	
Total	1441.60		99.99	

PROJECT STATION: 397
 DATE: 20/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2533 Long E 1414
 start stop duration Purpose code: 2
 TIME :22:53:00 23:25:00 32 (min) Area code : 1
 LOG :2888.40 2890.10 1.60 GearCond.code: 8
 FDEPTH: 200 208 Validity code: 1
 BDEPTH: 200 208
 Towing dir: 298° Wire out: 850 m Speed: 32 kn*10
 Sorted: 93 Kg Total catch: 419.85 CATCH/HOUR: 787.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	408.38	1721	51.88	101
Merluccius capensis male	365.34	2025	46.41	100
Todarodes sagittatus	6.44	26	1.07	
Sufflogobius bibarbatu	3.38		0.43	
Lepidopus caudatus	1.69	17	0.21	
Total	787.23		100.00	

PROJECT STATION: 402
 DATE: 21/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2519 Long E 1421
 start stop duration Purpose code: 3
 TIME :13:15:00 13:45:00 30 (min) Area code : 1
 LOG :2985.10 2986.00 1.55 GearCond.code:
 FDEPTH: 158 156 Validity code:
 BDEPTH: 158 156
 Towing dir: 360° Wire out: 650 m Speed: 34 kn*10
 Sorted: 49 Kg Total catch: 250.00 CATCH/HOUR: 500.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	271.00	1620	54.20	112
Merluccius capensis male	197.00	1360	39.40	111
Trachurus capensis	11.00	50	2.20	
Callorhinus capensis	7.00	2	1.40	
Sufflogobius bibarbatu	7.00		1.40	
Chelidonichthys capensis	7.00	20	1.40	
Total	500.00		100.00	

PROJECT STATION: 403
 DATE: 21/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2449 Long E 1403
 start stop duration Purpose code: 3
 TIME :16:46:00 17:16:00 30 (min) Area code : 2
 LOG :3020.60 3022.00 1.50 GearCond.code: 8
 FDEPTH: 163 161 Validity code: 9
 BDEPTH: 163 161
 Towing dir: 360° Wire out: 650 m Speed: 28 kn*10
 Sorted: 100 Kg Total catch: 100.00 CATCH/HOUR: 200.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis	200.00		100.00	

PROJECT STATION: 404
 DATE: 21/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2450 Long E 1353
 start stop duration Purpose code: 3
 TIME :20:12:00 20:45:00 33 (min) Area code : 2
 LOG :3035.70 3036.90 1.70 GearCond.code:
 FDEPTH: 226 228 Validity code:
 BDEPTH: 226 228
 Towing dir: 20° Wire out: 900 m Speed: 24 kn*10
 Sorted: 105 Kg Total catch: 1940.00 CATCH/HOUR: 3527.27

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	1744.00	49.44	114
Merluccius capensis male	1462.73	41.47	113
Sufflogobius bibarbatu	150.64	4.27	
Merluccius paradoxus	71.96	2.04	
Malacocephalus laevis	36.73	1.04	
PORTUNIDAE	18.36	0.52	
Lophius upsicephalus	16.73	0.47	
Austrogobius microlepis	13.27	0.38	
Squilla sp	3.27	0.09	
Galeus polli	3.27	0.09	
Lepidopus caudatus	3.27	0.09	
Chlorophthalmus punctatus	1.64	0.05	
Total	3525.87	99.95	

PROJECT STATION: 408
 DATE: 22/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2423 Long E 1345
 start stop duration Purpose code: 3
 TIME :04:52:00 05:22:00 30 (min) Area code : 2
 LOG :3089.30 3090.90 1.60 GearCond.code:
 FDEPTH: 317 314 Validity code:
 BDEPTH: 317 314
 Towing dir: 342° Wire out: 1050 m Speed: 32 kn*10
 Sorted: 21 Kg Total catch: 267.38 CATCH/HOUR: 534.76

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	195.00	30.4	121
Malacocephalus laevis	112.00	20.94	
Merluccius capensis male	103.40	19.8	122
Lophius upsicephalus	45.20	8.45	
MAJIDAE	17.20	3.22	
Nezumia sp	13.75	2.57	
Squilla sp	12.40	2.32	
Helicolenus dactylopterus	10.80	2.02	
Galeus polli	9.12	1.71	
PORTUNIDAE	7.20	1.35	
Todaropsis eblanae	4.00	0.75	
Selachophidium guentheri	2.68	0.50	
Thyriscus atun	1.60	0.30	
Ebinania costaeacanarie	0.40	0.07	
Total	534.76	100.00	

PROJECT STATION: 405
 DATE: 21/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2450 Long E 1347
 start stop duration Purpose code: 3
 TIME :22:10:00 22:40:00 30 (min) Area code : 2
 LOG :3045.40 3047.20 1.60 GearCond.code:
 FDEPTH: 275 273 Validity code:
 BDEPTH: 275 273
 Towing dir: 260° Wire out: 1000 m Speed: 36 kn*10
 Sorted: 99 Kg Total catch: 754.25 CATCH/HOUR: 1508.50

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis male	585.00	38.78	116
Merluccius capensis female	420.00	27.84	115
Malacocephalus laevis	150.00	9.94	
Merluccius paradoxus	150.00	9.94	
Todaropsis eblanae	58.60	3.88	
Callinectes sp	36.00	2.39	
Sufflogobius bibarbatu	25.60	1.70	
MAJIDAE	24.50	1.62	
Galeus polli	21.80	1.45	
Lepidopus caudatus	11.60	0.77	
Lophius upsicephalus	7.60	0.50	
Squilla sp	6.00	0.40	
Trachurus capensis	5.20	0.34	
Ebinania costaeacanarie	4.80	0.32	
Helicolenus dactylopterus	1.80	0.12	
Total	1508.50	99.99	

PROJECT STATION: 409
 DATE: 22/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2424 Long E 1355
 start stop duration Purpose code: 3
 TIME :07:08:00 07:38:00 30 (min) Area code : 2
 LOG :3103.50 3104.90 1.40 GearCond.code:
 FDEPTH: 251 254 Validity code:
 BDEPTH: 251 254
 Towing dir: 360° Wire out: 900 m Speed: 28 kn*10
 Sorted: 83 Kg Total catch: 301.91 CATCH/HOUR: 603.82

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	278.20	46.07	123
Merluccius capensis male	147.60	24.44	124
Lophius upsicephalus	64.40	10.67	
Malacocephalus laevis	39.00	6.46	
Todaropsis eblanae	18.20	3.01	
Merluccius paradoxus	16.20	2.68	
Austrogobius microlepis	12.60	2.25	
Squilla sp	9.10	1.51	
Trachurus capensis	6.80	1.13	
Pterothrissus belloci	6.50	1.08	
PORTUNIDAE	1.62	0.27	
Lepidopus caudatus	1.36	0.23	
Bastanago albescens	1.10	0.18	
Galeus polli	0.14	0.02	
Total	603.82	100.00	

PROJECT STATION: 406
 DATE: 21/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2450 Long E 1343
 start stop duration Purpose code: 3
 TIME :23:59:00 00:29:00 30 (min) Area code : 2
 LOG :3055.70 3057.30 1.50 GearCond.code:
 FDEPTH: 363 363 Validity code:
 BDEPTH: 363 363
 Towing dir: 25° Wire out: 1050 m Speed: 32 kn*10
 Sorted: 60 Kg Total catch: 391.50 CATCH/HOUR: 783.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	328.00	41.89	118
Merluccius capensis male	111.00	14.18	117
Coelorinchus fasciatus	84.00	10.73	
Notacanthus saxepinis	80.00	10.22	
Galeus polli	54.00	6.90	
Lophius upsicephalus	32.00	4.09	
Helicolenus dactylopterus	25.00	3.58	
Nezumia leonis	20.00	2.55	
MAJIDAE	20.00	2.55	
Callinectes sp	10.00	1.28	
Todarodes sagittatus	6.00	0.77	
Merluccius paradoxus	6.00	0.77	
Squilla sp	2.00	0.26	
Ebinania costaeacanarie	2.00	0.26	
Total	783.00	100.00	

PROJECT STATION: 410
 DATE: 22/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2424 Long E 1359
 start stop duration Purpose code: 3
 TIME :09:42:00 09:50:00 8 (min) Area code : 2
 LOG :3112.60 3113.40 0.30 GearCond.code:
 FDEPTH: 198 200 Validity code:
 BDEPTH: 198 200
 Towing dir: 30° Wire out: 800 m Speed: 30 kn*10
 Sorted: 110 Kg Total catch: 191.50 CATCH/HOUR: 1436.25

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	738.00	51.38	125
Merluccius capensis male	382.80	26.63	126
Lophius upsicephalus	287.75	14.46	
Thyriscus atun	39.00	2.72	
Austrogobius microlepis	38.00	2.51	
Todaropsis eblanae	12.00	0.84	
Trachurus capensis	8.25	0.57	
PORTUNIDAE	6.00	0.42	
Squilla sp	3.00	0.21	
Sufflogobius bibarbatu	1.50	0.10	
Malacocephalus laevis	1.50	0.10	
Bastanago albescens	0.75	0.05	
Total	1436.25	99.99	

PROJECT STATION: 407
 DATE: 22/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2437 Long E 1335
 start stop duration Purpose code: 3
 TIME :02:28:00 02:58:00 30 (min) Area code : 2
 LOG :3071.90 3073.30 1.50 GearCond.code:
 FDEPTH: 393 394 Validity code:
 BDEPTH: 393 394
 Towing dir: 346° Wire out: 1150 m Speed: 28 kn*10
 Sorted: 49 Kg Total catch: 49.70 CATCH/HOUR: 99.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius paradoxus female	43.60	43.86	120
Galeus polli	16.20	16.30	
Helicolenus dactylopterus	7.60	7.65	
Coelorinchus fasciatus	6.60	6.64	
Selachophidium guentheri	5.80	5.84	
Merluccius capensis	5.20	5.23	
Todarodes sagittatus	4.60	4.63	
Nezumia leonis	3.40	3.42	
Merluccius paradoxus male	3.20	3.22	119
Callinectes sp	2.60	2.62	
Ebinania costaeacanarie	0.60	0.60	
Total	99.40	100.01	

PROJECT STATION: 411
 DATE: 22/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2404 Long E 1415
 start stop duration Purpose code: 1
 TIME :12:10:00 12:15:00 5 (min) Area code : 2
 LOG :3141.50 3141.70 0.14 GearCond.code:
 FDEPTH: 114 115 Validity code:
 BDEPTH: 114 115
 Towing dir: 227° Wire out: 500 m Speed: 24 kn*10
 Sorted: Kg Total catch: 20.00 CATCH/HOUR: 240.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Sufflogobius bibarbatu	240.00	100.00	
Total	240.00	100.00	

PROJECT STATION: 412
 DATE: 22/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2402 Long E 1401
 start stop duration Purpose code: 3
 TIME :15:40:00 16:10:00 30 (min) Area code : 2
 LOG :3169.20 3170.80 1.44 GearCond.code:
 FDEPTH: 200 203 Validity code:
 BDEPTH: 200 203
 Towing dir: 354° Wire out: 750 m Speed: 32 kn*10
 Sorted: 89 Kg Total catch: 568.10 CATCH/HOUR: 1136.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	613.00	53.95	128
Merluccius capensis male	497.80	43.61	127
Sufflogobius bibarbatu	10.20	0.90	
Coelorinchus fasciatus	10.20	0.90	
Callinectes sp	2.60	0.23	
Lepidopus caudatus	1.20	0.11	
MYCTOPHIDAE	1.20	0.11	
Total	1136.20	100.01	

DATE:22/ 9/90 GEAR TYPE: BT No:1 PROJECT STATION: 413
 start stop duration POSITION:Lat S 2401
 TIME :17:43:00 18:13:00 30 (min) Purpose code: 3
 LOG :3184.90 3186.30 1.70 Area code : 2
 FDEPTH: 247 243 GearCond.code:
 BDEPTH: 247 243 Validity code:
 Towing dir: 356° Wire out: 850 m Speed: 28 kn*10

Sorted: 49 Kg Total catch: 245.00 CATCH/HOUR: 490.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
weight	numbers		
Merluccius capensis female	233.00	820	47.55 129
Merluccius capensis male	214.00	890	43.67 130
Merluccius paradoxus	31.00	120	6.33
Malacocephalus laevis	6.00	230	1.22
Sufflogobius bibarbatu	5.00	450	1.02
Helicolenus dactylopterus	1.00	20	0.20
Total	490.00		99.99

DATE:22/ 9/90 GEAR TYPE: BT No:1 PROJECT STATION: 414
 start stop duration POSITION:Lat S 2400
 TIME :21:25:00 21:55:00 30 (min) Purpose code: 3
 LOG :3206.50 3207.00 1.60 Area code : 2
 FDEPTH: 270 269 GearCond.code:
 BDEPTH: 270 269 Validity code:
 Towing dir: 340° Wire out: 900 m Speed: 26 kn*10

Sorted: Kg Total catch: 1.50 CATCH/HOUR: 3.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
weight	numbers		
Sufflogobius bibarbatu	1.00		33.33
MYCTOPHIDAE	1.00		33.33
Merluccius capensis	0.90	2	30.00
Scomberesox saurus	0.10	2	3.33
Total	3.00		99.99

DATE:23/ 9/90 GEAR TYPE: BT No:1 PROJECT STATION: 415
 start stop duration POSITION:Lat S 2359
 TIME :00:25:00 00:55:00 30 (min) Purpose code: 3
 LOG :3222.50 3224.00 1.70 Area code : 2
 FDEPTH: 303 308 GearCond.code:
 BDEPTH: 303 308 Validity code:
 Towing dir: 343° Wire out:1000 m Speed: 28 kn*10

Sorted: 14 Kg Total catch: 14.45 CATCH/HOUR: 28.90

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
weight	numbers		
Merluccius capensis female	20.20	66	69.90 132
Merluccius capensis male	2.60	10	9.00 131
MYCTOPHIDAE	2.40		8.30
Helicolenus dactylopterus	1.60	80	5.54
Sufflogobius bibarbatu	0.80		2.77
Galeus polli	0.80	14	2.77
Coelorrinchus fasciatus	0.40	16	1.38
Chlorophthalmus punctatus	0.10	4	0.35
Total	28.90		100.01

DATE:23/ 9/90 GEAR TYPE: BT No:1 PROJECT STATION: 416
 start stop duration POSITION:Lat S 2401
 TIME :02:26:00 02:56:00 30 (min) Purpose code: 3
 LOG :3234.90 3236.30 1.50 Area code : 2
 FDEPTH: 457 463 GearCond.code:
 BDEPTH: 457 463 Validity code:
 Towing dir: 340° Wire out:1200 m Speed: 28 kn*10

Sorted: 6 Kg Total catch: 6.05 CATCH/HOUR: 12.10

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
weight	numbers		
Onamastrephes pteropus	3.00	16	24.79
Notacanthus saxepinis	2.60	94	21.49
Plesionika martia	2.00		16.53
Paradiplospinus gracilis	1.40	10	11.57
Hoplostethus mediterraneus	0.80	40	6.61
Galeus polli	0.60	14	4.98
MYCTOPHIDAE	0.60	20	4.98
Callinectes sp	0.60	20	4.98
Coelorrinchus fasciatus	0.20	8	1.65
Diplophos sp.	0.20	14	1.65
Helicolenus dactylopterus	0.10	6	0.83
Scomberesox saurus	0.00	2	
Newichthys scolopacea	0.00	2	
Total	12.10		100.00

DATE:23/ 9/90 GEAR TYPE: BT No:1 PROJECT STATION: 417
 start stop duration POSITION:Lat S 2339
 TIME :06:27:00 07:07:00 30 (min) Purpose code: 3
 LOG :3267.00 3268.50 1.30 Area code : 2
 FDEPTH: 382 382 GearCond.code:
 BDEPTH: 382 382 Validity code:
 Towing dir: 20° Wire out:1100 m Speed: 30 kn*10

Sorted: 37 Kg Total catch: 115.50 CATCH/HOUR: 231.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
weight	numbers		
Helicolenus dactylopterus	50.00	456	21.65
Merluccius paradoxus female	34.60	44	14.98
Deania calcea	34.50	66	14.94
Malacocephalus laevis	29.50	756	12.77
Galeus polli	19.50	166	8.01
Todaropsis eblanae	11.00	46	4.76
Epinania costaeacantha	9.50	70	4.11
Hoplostethus cedonati	9.00	156	3.90
Merluccius paradoxus male	8.00	10	3.46
Selachophidium guentheri	7.20	270	3.12
MAJIDAE	4.80	4	2.08
Shrimps, small, non coms.	4.50	700	1.95
Lophius upiocephalus	3.00	10	1.30
MYCTOPHIDAE	2.90	450	1.26
Lycoteuthis diadema	2.50	40	1.08
Trachurus capensis	2.00	6	0.87
Callinectes sp	0.50	26	0.22
Idiacanthus atlanticus	0.00	16	
Total	232.00		100.46

DATE:23/ 9/90 GEAR TYPE: BT No:1 PROJECT STATION: 418
 start stop duration POSITION:Lat S 2340
 TIME :09:03:00 09:33:00 30 (min) Purpose code: 3
 LOG :3203.50 3205.20 1.60 Area code : 2
 FDEPTH: 270 270 GearCond.code:
 BDEPTH: 270 270 Validity code:
 Towing dir: 12° Wire out:1000 m Speed: 34 kn*10

Sorted: 84 Kg Total catch: 589.82 CATCH/HOUR: 1179.64

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
weight	numbers		
Merluccius capensis female	602.00	1722	51.03 135
Merluccius capensis male	359.80	1064	30.50 136
Lophius upiocephalus	51.80	14	4.39
Chlorophthalmus punctatus	39.40	1204	2.49
Sufflogobius bibarbatu	23.80		2.02
MYCTOPHIDAE	23.80		2.02
Trachurus capensis	21.00	56	1.78
Merluccius paradoxus	21.00	70	1.78
Malacocephalus laevis	19.04	714	1.61
Helicolenus dactylopterus	8.40	154	0.71
Galeus polli	4.76	140	0.40
PORTUNIDAE	4.20	98	0.36
Squilla sp	4.05	126	0.34
Pterothrissus belloci	3.64	14	0.31
Lycoteuthis diadema	2.94	28	0.25
Total	1179.64		99.99

DATE:23/ 9/90 GEAR TYPE: BT No:1 PROJECT STATION: 419
 start stop duration POSITION:Lat S 2339
 TIME :11:02:00 11:32:00 30 (min) Purpose code: 3
 LOG :3297.10 3298.60 1.40 Area code : 2
 FDEPTH: 228 227 GearCond.code:
 BDEPTH: 228 227 Validity code:
 Towing dir: 20° Wire out: 900 m Speed: 30 kn*10

Sorted: 98 Kg Total catch: 689.50 CATCH/HOUR: 1379.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
weight	numbers		
Merluccius capensis female	757.40	2226	54.92 138
Merluccius capensis male	371.00	1400	26.90 137
Coelorrinchus fasciatus	75.60	2592	5.48
Chlorophthalmus punctatus	43.40	3960	3.15
Todaropsis sagittatus	39.60	2772	2.23
Sufflogobius bibarbatu	23.80	42	1.73
Lophius upiocephalus	16.80	42	1.22
Callinectes sp	15.40	630	1.12
Helicolenus dactylopterus	11.20	1526	0.81
Galeus polli	8.40	336	0.61
Todaropsis eblanae	1.40	28	0.10
Total	1379.00		100.00

DATE:23/ 9/90 GEAR TYPE: BT No:1 PROJECT STATION: 420
 start stop duration POSITION:Lat S 2335
 TIME :13:40:00 14:10:00 30 (min) Purpose code: 3
 LOG :3316.50 3318.10 1.60 Area code : 2
 FDEPTH: 180 177 GearCond.code:
 BDEPTH: 180 177 Validity code:
 Towing dir: 360° Wire out: 700 m Speed: 32 kn*10

Sorted: 82 Kg Total catch: 206.55 CATCH/HOUR: 413.10

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
weight	numbers		
Merluccius capensis male	240.00	1496	58.10 139
Merluccius capensis female	155.00	780	37.52 140
Coelorrinchus fasciatus	8.00	270	1.94
Sufflogobius bibarbatu	6.50	170	1.57
Trachurus capensis	1.80	6	0.44
Callinectes sp	1.00	50	0.24
Merluccius capensis juveniles	0.50	20	0.12
Todaropsis eblanae	0.30	6	0.07
Total	413.10		100.00

DATE:23/ 9/90 GEAR TYPE: BT No:1 PROJECT STATION: 421
 start stop duration POSITION:Lat S 2320
 TIME :16:34:00 16:54:00 20 (min) Purpose code: 3
 LOG :3339.30 3340.30 1.20 Area code : 2
 FDEPTH: 167 167 GearCond.code:
 BDEPTH: 167 167 Validity code:
 Towing dir: 320° Wire out: 650 m Speed: 30 kn*10

Sorted: 75 Kg Total catch: 300.80 CATCH/HOUR: 902.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
weight	numbers		
Merluccius capensis male	459.60	3420	50.93 141
Merluccius capensis female	420.00	1932	46.54 142
Sufflogobius bibarbatu	7.20	660	0.80
Trachurus capensis	7.20	60	0.80
Lepidopus caudatus	4.80	180	0.53
Coelorrinchus fasciatus	3.60	48	0.40
Todaropsis eblanae	0.00	12	
Total	902.40		100.00

DATE:23/ 9/90 GEAR TYPE: BT No:1 PROJECT STATION: 422
 start stop duration POSITION:Lat S 2319
 TIME :17:58:00 18:18:00 20 (min) Purpose code: 3
 LOG :3349.20 3350.00 1.00 Area code : 2
 FDEPTH: 230 242 GearCond.code:
 BDEPTH: 230 242 Validity code:
 Towing dir: 340° Wire out: 800 m Speed: 30 kn*10

Sorted: 71 Kg Total catch: 310.34 CATCH/HOUR: 931.02

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
weight	numbers		
Merluccius capensis female	575.81	2079	62.28 143
Merluccius capensis male	324.99	891	24.91 144
Malacocephalus laevis	9.09	207	0.90
Chlorophthalmus punctatus	7.02	336	0.75
Todaropsis eblanae	3.39	27	0.36
Pterothrissus belloci	2.58	12	0.28
MYCTOPHIDAE	1.29		0.14
Sufflogobius bibarbatu	1.29	29	0.14
PORTUNIDAE	1.29	29	0.14
Galeus polli	0.27	27	0.03
Total	931.02		100.01

PROJECT STATION: 423
 DATE: 23/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2319 Long E 1323
 start stop duration
 TIME :18:15:00 18:45:00 30 (min) Purpose code: 3
 LOG :3356.70 3358.50 1.60 Area code : 2
 FDEPTH: 303 317 GearCond.code:
 BDEPTH: 303 317 Validity code:
 Towing dir: 335° Wire out: 1000 m Speed: 36 kn*10
 Sorted: Kg Total catch: 91.60 CATCH/HOUR: 183.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	105.90	150	57.81	145
Merluccius capensis male	26.60	58	14.32	146
Todaropsis eblanæ	10.80	42	5.90	
Chlorophthalmus punctatus	7.70	274	4.20	
Lophius upiocephalus	7.40	8	4.04	
Helicolenus dactylopterus	6.56	336	3.58	
Malacocephalus laevis	6.34	196	3.46	
Galeus polli	4.80	96	2.62	
Trachurus capensis	3.96	16	2.16	
PORTUNIDAE	1.72	62	0.94	
MYCTOPHIDAE	0.50		0.27	
Shrimps, small, non comm.	0.40	80	0.22	
Lepidopus caudatus	0.40	2	0.22	
Scyllia sp	0.12	6	0.07	
Total	183.20		100.01	

PROJECT STATION: 424
 DATE: 23/ 9/90 GEAR TYPE: HT No:1 POSITION: Lat S 2313 Long E 1310
 start stop duration
 TIME :21:38:00 22:08:00 30 (min) Purpose code: 3
 LOG :3372.30 3374.00 1.60 Area code : 2
 FDEPTH: 400 400 GearCond.code:
 BDEPTH: 400 400 Validity code:
 Towing dir: 330° Wire out: 1100 m Speed: 34 kn*10
 Sorted: 52 Kg Total catch: 183.57 CATCH/HOUR: 367.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Deania calcea	168.00	560	45.76	
Merluccius paradoxus	53.90	78	14.68	147
Malacocephalus laevis	53.20	1400	14.49	
Selachophidium guntheri	25.90	636	7.05	
Helicolenus dactylopterus	18.20	134	4.96	
Hoplostethus cadonati	15.40	428	4.19	
Lophius upiocephalus	12.60	28	3.43	
Todaropsis eblanæ	9.40	22	2.56	
Ebinanio costaccanarie	2.80	8	0.76	
Notacanthus sexspinis	2.24	56	0.61	
Raja clavata	2.20	8	0.60	
PORTUNIDAE	1.40	22	0.38	
Shrimps, small, non comm.	1.40	210	0.38	
Idiacanthus atlanticus	0.40	14	0.11	
Total	367.04		99.96	

PROJECT STATION: 425
 DATE: 23/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2300 Long E 1301
 start stop duration
 TIME :23:59:00 00:29:00 30 (min) Purpose code: 3
 LOG :3388.10 3389.50 1.47 Area code : 2
 FDEPTH: 481 486 GearCond.code:
 BDEPTH: 481 486 Validity code:
 Towing dir: 340° Wire out: 1500 m Speed: 28 kn*10
 Sorted: 33 Kg Total catch: 234.60 CATCH/HOUR: 469.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Trachyrhinus scabrus	247.20	1068	52.69	
Merluccius paradoxus female	72.00	94	15.35	148
Nezumia leonis	34.80	732	7.42	
Hoplostethus cadonati	33.60	708	7.16	
Helicolenus dactylopterus	27.60	48	5.88	
Deania quadrispinosus	21.60	24	4.60	
Todarodes bagittatus	13.20	36	2.81	
Galeus polli	10.80	48	2.30	
Epigonus denticulatus	8.40	192	1.79	
Total	469.20		100.00	

PROJECT STATION: 426
 DATE: 24/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2300 Long E 1319
 start stop duration
 TIME :06:57:00 07:27:00 30 (min) Purpose code: 3
 LOG :3419.30 3420.70 1.50 Area code : 2
 FDEPTH: 352 355 GearCond.code:
 BDEPTH: 352 355 Validity code:
 Towing dir: 340° Wire out: 1100 m Speed: 28 kn*10
 Sorted: Kg Total catch: 93.82 CATCH/HOUR: 187.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	64.00	54	34.11	151
Malacocephalus laevis	34.20	500	18.23	
Merluccius capensis male	32.00	38	17.05	152
Merluccius paradoxus female	22.60	36	12.04	149
Galeus polli	7.44	116	3.97	
Schedophilus huttoni	6.40	4	3.41	
Lophius upiocephalus	6.20	6	3.30	
Todaropsis eblanæ	4.20	38	2.24	
Merluccius paradoxus male	3.40	2	1.81	150
Trachurus capensis	2.40	18	1.28	
Helicolenus dactylopterus	1.44	20	0.77	
PORTUNIDAE	1.24	24	0.66	
Trachyrhinus scabrus	1.20	4	0.64	
Shrimps, small, non comm.	0.60	40	0.32	
Raja clavata	0.20	2	0.11	
Hoplostethus cadonati	0.12	4	0.06	
Total	187.64		100.00	

PROJECT STATION: 427
 DATE: 24/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2258 Long E 1329
 start stop duration
 TIME :09:02:00 09:32:00 30 (min) Purpose code: 3
 LOG :3432.90 3433.90 1.20 Area code : 2
 FDEPTH: 253 248 GearCond.code:
 BDEPTH: 253 248 Validity code:
 Towing dir: 30° Wire out: 900 m Speed: 20 kn*10
 Sorted: 44 Kg Total catch: 322.25 CATCH/HOUR: 664.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	400.50	1230	60.27	153
Merluccius capensis male	223.50	824	33.63	154
Merluccius paradoxus	22.50	74	3.39	
Malacocephalus laevis	18.00	90	2.71	
Total	664.50		100.00	

PROJECT STATION: 428
 DATE: 24/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2256 Long E 1334
 start stop duration
 TIME :10:45:00 11:05:00 20 (min) Purpose code: 3
 LOG :3439.90 3440.00 1.00 Area code : 2
 FDEPTH: 149 149 GearCond.code:
 BDEPTH: 149 149 Validity code:
 Towing dir: 20° Wire out: 700 m Speed: 30 kn*10
 Sorted: 16 Kg Total catch: 31.60 CATCH/HOUR: 94.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis male	58.20	456	61.39	156
Merluccius capensis female	36.60	216	38.61	155
Total	94.80		100.00	

PROJECT STATION: 429
 DATE: 24/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2259 Long E 1352
 start stop duration
 TIME :13:50:00 14:10:00 20 (min) Purpose code: 3
 LOG :3461.90 3463.50 1.50 Area code : 2
 FDEPTH: 140 139 GearCond.code:
 BDEPTH: 140 139 Validity code:
 Towing dir: 10° Wire out: 650 m Speed: 46 kn*10
 Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
N O C A T C H	0.00			
Total				

PROJECT STATION: 430
 DATE: 26/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2241 Long E 1400
 start stop duration
 TIME :06:40:00 06:45:00 5 (min) Purpose code: 3
 LOG :3455.10 3455.30 0.20 Area code : 2
 FDEPTH: 120 120 GearCond.code:
 BDEPTH: 120 120 Validity code:
 Towing dir: 360° Wire out: 550 m Speed: 30 kn*10
 Sorted: 5 Kg Total catch: 7.60 CATCH/HOUR: 91.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis	63.60	780	69.74	157
Trachurus capensis	27.60	960	30.26	158
Chelidonichthys capensis	0.00	12		
Total	91.20		100.00	

PROJECT STATION: 431
 DATE: 26/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2239 Long E 1349
 start stop duration
 TIME :08:23:00 08:26:00 3 (min) Purpose code: 3
 LOG :3558.70 3558.80 0.10 Area code : 2
 FDEPTH: 128 128 GearCond.code:
 BDEPTH: 128 128 Validity code:
 Towing dir: 360° Wire out: 600 m Speed: 30 kn*10
 Sorted: 58 Kg Total catch: 117.00 CATCH/HOUR: 2340.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	960.00	5200	41.03	160
Trachurus capensis	640.00	7880	27.35	161
Merluccius capensis male	640.00	4760	27.35	159
Austroglossus microlepis	80.00	240	3.42	162
Chelidonichthys capensis	20.00	120	0.85	163
Sufflogobius bibarbatus	0.00	120		
Total	2340.00		100.00	

PROJECT STATION: 432
 DATE: 26/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2239 Long E 1345
 start stop duration
 TIME :09:33:00 09:48:00 15 (min) Purpose code: 3
 LOG :3564.10 3564.80 0.70 Area code : 2
 FDEPTH: 130 129 GearCond.code:
 BDEPTH: 130 129 Validity code:
 Towing dir: 360° Wire out: 550 m Speed: 30 kn*10
 Sorted: 76 Kg Total catch: 2001.50 CATCH/HOUR: 8006.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Trachurus capensis	6466.50	76168	81.02	165
Merluccius capensis female	983.20	5544	12.28	166
Merluccius capensis male	522.00	5640	6.52	163
Thyrites atun	14.00	4	0.17	
Total	8006.00		99.99	

PROJECT STATION: 433
 DATE: 26/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2240 Long E 1337
 start stop duration
 TIME :11:03:00 11:33:00 30 (min) Purpose code: 3
 LOG :3574.70 3576.30 1.50 Area code : 2
 FDEPTH: 135 135 GearCond.code:
 BDEPTH: 135 135 Validity code:
 Towing dir: 360° Wire out: 600 m Speed: 32 kn*10
 Sorted: 105 Kg Total catch: 2940.00 CATCH/HOUR: 5880.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Trachurus capensis	5353.60	53536	91.05	166
Merluccius capensis female	291.20	2296	4.95	168
Merluccius capensis male	224.00	2608	3.81	167
Lepidopus caudatus	11.20	168	0.19	
Todaropsis eblanæ	0.00	56		
Total	5880.00		100.00	

PROJECT STATION: 427
 DATE: 24/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2258 Long E 1329
 start stop duration
 TIME :09:02:00 09:32:00 30 (min) Purpose code: 3
 LOG :3432.90 3433.90 1.20 Area code : 2
 FDEPTH: 253 248 GearCond.code:
 BDEPTH: 253 248 Validity code:
 Towing dir: 30° Wire out: 900 m Speed: 20 kn*10
 Sorted: 44 Kg Total catch: 322.25 CATCH/HOUR: 664.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP.NO.
	weight	numbers		
Merluccius capensis female	400.50	1230	60.27	153
Merluccius capensis male	223.50	824	33.63	154
Merluccius paradoxus	22.50	74	3.39	
Malacocephalus laevis	18.00	90	2.71	
Total	664.50		100.00	

PROJECT STATION: 434
 DATE:26/ 9/90 GEAR TYPE: BT No:1 POSITION:Lat S 2241 Long E 1331
 start stop duration
 TIME :12:50:00 13:20:00 30 (min) Purpose code: 3
 LOG :3587.20 3588.60 1.40 Area code : 2
 FDEPTH: 100 100 GearCond.code:
 BDEPTH: 100 100 Validity code:
 Towing dir: 350° Wire out: 700 m Speed: 20 kn*10

PROJECT STATION: 439
 DATE:26/ 9/90 GEAR TYPE: BT No:1 POSITION:Lat S 2240 Long E 1250
 start stop duration
 TIME :22:30:00 22:56:00 26 (min) Purpose code: 3
 LOG :3648.30 3649.60 1.30 Area code : 2
 FDEPTH: 400 510 GearCond.code:
 BDEPTH: 400 510 Validity code:
 Towing dir: 335° Wire out:1500 m Speed: 20 kn*10

Sorted: 51 Kg Total catch: 203.90 CATCH/HOUR: 407.00

Sorted: 40 Kg Total catch: 146.60 CATCH/HOUR: 338.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis male	248.00	1032	60.81	169
Merluccius capensis female	132.00	608	32.56	170
Trachurus capensis	21.60	128	5.30	
Coelorinchus fasciatus	3.20	24	0.78	
Lepidopus caudatus	1.60	24	0.39	
Sufflogobius bibarbatus	0.40	144	0.10	
Todaropsis eblanae	0.20	8	0.05	
Total	407.60	99.99		

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachyrinus scabrus	209.77	1142	62.01	
Centrophorus squamosus	41.54	5	12.26	
Helicolenus dactylopterus	22.85	42	6.75	
Nezumia leonis	20.77	471	6.14	
Desmia calcea	12.23	2	3.62	
Epigonus pandionis	10.38	173	3.07	
Lophius upsicephalus	10.30	7	3.07	
Merluccius paradoxus female	10.15	12	3.00	100
RAJIDAE	0.23	2	0.07	
Hoplostethus melanopus	0.00	9		
MYCTOPHIDAE	0.00	14		
Plesionika martia	0.00	7		
Callinectes sp	0.00	7		
Aristeus varidens	0.00	62		
Total	338.30	100.01		

PROJECT STATION: 435
 DATE:26/ 9/90 GEAR TYPE: BT No:1 POSITION:Lat S 2239 Long E 1324
 start stop duration
 TIME :14:23:00 15:03:00 30 (min) Purpose code: 3
 LOG :3597.10 3598.60 1.44 Area code : 2
 FDEPTH: 250 254 GearCond.code:
 BDEPTH: 250 254 Validity code:
 Towing dir: 350° Wire out: 900 m Speed: 30 kn*10

Sorted: 88 Kg Total catch: 695.75 CATCH/HOUR: 1391.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	579.00	2626	41.67	172
Merluccius capensis male	423.80	2678	30.46	171
Chlorophthalmus punctatus	135.20	9464	9.72	
Coelorinchus fasciatus	88.40	2340	6.35	
Galeus polli	41.60	728	2.99	
Trachurus capensis	37.70	104	2.71	
Squalus blainvilliei	31.20	52	2.34	
Callinectes sp	15.60	468	1.12	
Lophius upsicephalus	11.70	26	0.84	
Sufflogobius bibarbatus	10.40	1300	0.75	
Todaropsis eblanae	10.40	364	0.75	
Helicolenus dactylopterus	5.20	676	0.37	
MYCTOPHIDAE	0.50	500	0.04	
Total	1391.50	100.01		

PROJECT STATION: 440
 DATE:27/ 9/90 GEAR TYPE: BT No:1 POSITION:Lat S 2219 Long E 1247
 start stop duration
 TIME :02:13:00 02:43:00 30 (min) Purpose code: 3
 LOG :3676.60 3678.30 1.50 Area code : 2
 FDEPTH: 447 447 GearCond.code:
 BDEPTH: 447 447 Validity code:
 Towing dir: 360° Wire out:1300 m Speed: 34 kn*10

Sorted: 21 Kg Total catch: 126.25 CATCH/HOUR: 252.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachyrinus scabrus	114.00	630	45.15	
Hoplostethus melanopus	59.00	1060	23.37	
Centrophorus squamosus	28.20	2	11.17	
Merluccius paradoxus female	15.60		6.10	
Nezumia leonis	10.00	300	3.96	
Todarodes sagittatus	6.00	20	2.38	
Helicolenus dactylopterus	4.00	10	1.58	
Trachurus capensis	4.00	10	1.58	
Aristeus varidens	3.00	240	1.19	
Geryon maritae	2.20	2	0.87	
Coelorinchus fasciatus	2.00	30	0.79	
GONOSTOMATIDAE	2.00	130	0.79	
Galeus polli	1.00	10	0.40	
Plesionika martia	0.70	340	0.28	
Epigonus pandionis	0.50	10	0.20	
Notacanthus sexspinis	0.30	10	0.12	
Total	252.50	100.01		

PROJECT STATION: 436
 DATE:26/ 9/90 GEAR TYPE: BT No:1 POSITION:Lat S 2239 Long E 1314
 start stop duration
 TIME :16:25:00 16:55:00 30 (min) Purpose code: 3
 LOG :3609.90 3611.40 1.56 Area code : 2
 FDEPTH: 295 208 GearCond.code:
 BDEPTH: 295 208 Validity code:
 Towing dir: 350° Wire out:1000 m Speed: 30 kn*10

Sorted: 87 Kg Total catch: 193.40 CATCH/HOUR: 386.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	196.40	460	50.78	174
Merluccius capensis male	132.40	480	34.23	173
Coelorinchus fasciatus	17.60	464	4.55	
Trachurus capensis	10.80	16	2.79	
Galeus polli	9.60	272	2.48	
Chlorophthalmus punctatus	6.40	192	1.65	
Zu elongatus	5.60	2	1.45	
Helicolenus dactylopterus	4.80	336	1.24	
Callinectes sp	3.20	208	0.83	
Total	386.80	100.00		

PROJECT STATION: 441
 DATE:27/ 9/90 GEAR TYPE: BT No:1 POSITION:Lat S 2220 Long E 1252
 start stop duration
 TIME :04:03:00 04:33:00 30 (min) Purpose code: 3
 LOG :3687.40 3689.00 1.45 Area code : 2
 FDEPTH: 354 355 GearCond.code:
 BDEPTH: 354 355 Validity code:
 Towing dir: 360° Wire out:1050 m Speed: 32 kn*10

Sorted: Kg Total catch: 106.00 CATCH/HOUR: 212.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	79.00	172	37.26	182
Merluccius capensis male	37.20	84	17.55	181
Helicolenus dactylopterus	19.20	292	9.06	
Galeus polli	18.00		8.49	
Coelorinchus fasciatus	10.40	248	4.91	
Squalus zealandicus	10.00	12	4.72	
Rhinochimaera pacifica	7.60	20	3.58	
Todarodes sagittatus	5.20	12	2.45	
Merluccius paradoxus	4.40	6	2.00	
Oenotherus altilava	4.00	8	1.09	
Lophius upsicephalus	3.60	8	1.70	
Plesionika martia	2.40		1.13	
Nezumia leonis	2.40	128	1.13	
Hoplostethus melanopus	2.00	56	0.94	
Epigonus pandionis	1.60	68	0.75	
Omsastrephes pteropus	1.20	20	0.57	
Halargyreus laevis	0.80	8	0.38	
Coelorinchus polli	0.80	36	0.38	
Chlorophthalmus punctatus	0.60	10	0.28	
Plesionika acanthurus	0.40		0.19	
Callinectes sp	0.40	8	0.19	
Laemonema laureysi	0.40	4	0.19	
Hymenocephalus italicus	0.20	4	0.09	
Total	211.80	99.91		

PROJECT STATION: 437
 DATE:26/ 9/90 GEAR TYPE: BT No:1 POSITION:Lat S 2239 Long E 1302
 start stop duration
 TIME :18:44:00 19:14:00 30 (min) Purpose code: 3
 LOG :3627.30 3628.60 1.60 Area code : 2
 FDEPTH: 306 307 GearCond.code:
 BDEPTH: 306 307 Validity code:
 Towing dir: 45° Wire out:1000 m Speed: 26 kn*10

Sorted: 67 Kg Total catch: 133.80 CATCH/HOUR: 267.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	112.00	252	41.85	176
Merluccius capensis male	60.00	184	22.42	175
Trachurus capensis	22.00	40	8.22	177
Lophius upsicephalus	16.40	8	6.13	
Todaropsis eblanae	14.00	56	5.23	
Helicolenus dactylopterus	11.20	480	4.19	
Galeus polli	10.00	332	3.74	
Coelorinchus sp	5.20	272	1.94	
Chlorophthalmus punctatus	5.20	272	1.94	
C. R. A. B. S.	0.00	24		
MYCTOPHIDAE	0.00	20		
Total	256.60	95.66		

PROJECT STATION: 438
 DATE:26/ 9/90 GEAR TYPE: BT No:1 POSITION:Lat S 2240 Long E 1254
 start stop duration
 TIME :20:50:00 21:20:00 30 (min) Purpose code: 3
 LOG :3640.00 3641.40 1.50 Area code : 2
 FDEPTH: 352 349 GearCond.code:
 BDEPTH: 352 349 Validity code:
 Towing dir: 352° Wire out:1050 m Speed: 28 kn*10

Sorted: 89 Kg Total catch: 89.80 CATCH/HOUR: 179.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	48.00	94	26.73	179
Centrophorus squamosus	30.00	2	16.70	
Coelorinchus fasciatus	22.40		12.47	
Galeus polli	16.80		9.35	
Helicolenus dactylopterus	13.20		7.35	
Lophius upsicephalus	12.60	10	7.02	
Merluccius capensis male	12.00	22	6.68	178
Todaropsis eblanae	8.00		4.90	
Shrimps, small, non comm.	5.60		3.12	
Epigonus pandionis	3.60		2.00	
Trachurus capensis	2.00	10	1.11	
Oenotherus altilava	0.80		0.45	
Notacanthus sexspinis	0.80	20	0.45	
Desmia quadriripinosus	0.80	2		
Callinectes sp	0.80	16		
Beryx splendens	0.80	2		
Chlorophthalmus punctatus	0.80	2		
Hoplostethus melanopus	0.80	4		
MYCTOPHIDAE	0.80	18		
Total	176.60	98.33		

PROJECT STATION: 442
 DATE: 27/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2220 Long E 1307
 start stop duration
 TIME :06:45:00 07:15:00 30 (min) Purpose code: 3
 LOG :3705.70 3707.10 1.40 Area code : 2
 FDEPTH: 252 247 GearCond.code:
 BDEPTH: 252 247 Validity code:
 Towing dir: 360° Wire out: 900 m Speed: 28 kn*10
 Sorted: 48 Kg Total catch: 575.00 CATCH/HOUR: 1150.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	660.00	2064	57.39	184
Merluccius capensis male	288.00	1416	25.04	183
Galeus polli	81.00	960	7.10	
Chlorophthalmus punctatus	21.00	3816	4.59	
Coelorinchus fasciatus	36.00	864	3.13	
Helicolenus dactylopterus	12.00	1152	1.04	
Callinectes sp	4.80	288	0.42	
Lophius upsicephalus	4.80	24	0.42	
Todarodes sagittatus	4.80	168	0.42	
Aristeus varidens	2.40	960	0.21	
Pterothrissus belloci	2.40	24	0.21	
Lepidopus caudatus	0.00	2		
Sufflogobius bibarbatu	0.00	336		
MYCTOPHIDAE	0.00	696		
Total	1149.60		99.97	

PROJECT STATION: 443
 DATE: 27/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2220 Long E 1321
 start stop duration
 TIME :08:45:00 09:15:00 30 (min) Purpose code: 3
 LOG :3720.00 3721.50 1.50 Area code : 2
 FDEPTH: 213 204 GearCond.code:
 BDEPTH: 213 204 Validity code:
 Towing dir: 90° Wire out: 800 m Speed: 30 kn*10
 Sorted: 45 Kg Total catch: 2000.00 CATCH/HOUR: 4000.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis male	2904.00	13904	72.60	185
Trachurus capensis	704.00	2464	17.60	187
Merluccius capensis female	334.40	1496	8.36	186
Coelorinchus fasciatus	35.20	2024	0.88	
Lophius upsicephalus	8.80	88	0.22	
Callinectes sp	0.00	176		
MYCTOPHIDAE	0.00	88		
Sufflogobius bibarbatu	0.00	88		
Chlorophthalmus punctatus	0.00	440		
Total	3986.40		99.86	

PROJECT STATION: 444
 DATE: 27/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2219 Long E 1327
 start stop duration
 TIME :10:36:00 10:56:00 20 (min) Purpose code: 3
 LOG :3728.10 3729.00 1.00 Area code : 2
 FDEPTH: 170 170 GearCond.code:
 BDEPTH: 170 170 Validity code:
 Towing dir: 330° Wire out: 750 m Speed: 30 kn*10
 Sorted: 70 Kg Total catch: 2500.00 CATCH/HOUR: 7500.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis male	2730.00	14490	36.40	188
Trachurus capensis	2310.00	3080	30.80	190
Merluccius capensis female	2205.00	6930	29.40	189
Coelorinchus fasciatus	126.00	2205	1.68	
Sufflogobius bibarbatu	0.00	630		
Merluccius capensis juveniles	0.00	210		
Total	7371.00		98.28	

PROJECT STATION: 445
 DATE: 27/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2220 Long E 1341
 start stop duration
 TIME :12:37:00 12:47:00 10 (min) Purpose code: 3
 LOG :3743.20 3743.80 0.47 Area code : 2
 FDEPTH: 126 126 GearCond.code:
 BDEPTH: 126 126 Validity code:
 Towing dir: 360° Wire out: 500 m Speed: 36 kn*10
 Sorted: 217 Kg Total catch: 217.20 CATCH/HOUR: 1303.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis	970.20	7656	74.45	191
Trachurus capensis	204.60	3078	15.70	192
Chelidonichthys capensis	107.40	480	8.24	
Coelorinchus capensis	12.60	12	0.97	
Lophius upsicephalus	4.80	6	0.37	
Squalus megalops	1.80	6	0.14	
Pterothrissus belloci	1.80	6	0.14	
Total	1383.20		100.01	

PROJECT STATION: 446
 DATE: 27/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2207 Long E 1345
 start stop duration
 TIME :14:24:00 14:44:00 20 (min) Purpose code: 3
 LOG :3756.70 3757.80 1.09 Area code : 2
 FDEPTH: 113 111 GearCond.code:
 BDEPTH: 113 111 Validity code:
 Towing dir: 4° Wire out: 400 m Speed: 33 kn*10
 Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
N O C A T C H	0.00			
Total				

PROJECT STATION: 447
 DATE: 27/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2200 Long E 1331
 start stop duration
 TIME :16:28:00 16:48:00 20 (min) Purpose code: 3
 LOG :3773.90 3775.10 1.20 Area code : 2
 FDEPTH: 135 134 GearCond.code:
 BDEPTH: 135 134 Validity code:
 Towing dir: 350° Wire out: 500 m Speed: 36 kn*10
 Sorted: 83 Kg Total catch: 586.30 CATCH/HOUR: 1758.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachurus capensis	657.40	6778	37.15	195
Merluccius capensis male	617.10	5181	35.08	193
Merluccius capensis female	468.40	2376	27.77	194
Total	1758.90		100.00	

PROJECT STATION: 448
 DATE: 27/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2200 Long E 1315
 start stop duration
 TIME :18:31:00 19:01:00 30 (min) Purpose code: 3
 LOG :3791.30 3792.80 1.50 Area code : 2
 FDEPTH: 172 181 GearCond.code:
 BDEPTH: 172 181 Validity code:
 Towing dir: 266° Wire out: 800 m Speed: 30 kn*10
 Sorted: 65 Kg Total catch: 1500.00 CATCH/HOUR: 3000.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachurus capensis	1150.00	15428	38.33	198
Merluccius capensis male	920.00	9660	30.67	196
Merluccius capensis female	874.00	2438	29.13	197
Coelorinchus fasciatus	55.80	2182	2.78	
Chelidonichthys capensis	23.00	92	0.77	
Pterothrissus belloci	4.60	46	0.15	
Sufflogobius bibarbatu	4.60	414	0.15	
Chlorophthalmus punctatus	0.00	138		
Todarodes sagittatus	0.00	46		
Lepidopus caudatus	0.00	46		
Total	3059.00		101.96	

PROJECT STATION: 449
 DATE: 27/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2200 Long E 1305
 start stop duration
 TIME :20:27:00 20:50:00 23 (min) Purpose code: 2
 LOG :3803.20 3804.30 1.10 Area code : 2
 FDEPTH: 252 254 GearCond.code:
 BDEPTH: 252 254 Validity code:
 Towing dir: 360° Wire out: 900 m Speed: 30 kn*10
 Sorted: 65 Kg Total catch: 100.80 CATCH/HOUR: 262.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	152.09	310	57.84	200
Trachurus capensis	48.04	198	18.65	201
Merluccius capensis male	28.09	104	9.92	199
Chlorophthalmus punctatus	13.04	637	4.96	
Lophius upsicephalus	10.17	10	3.87	
Coelorinchus fasciatus	3.39	68	1.29	
Austroglossus microlepis	3.39	3	1.29	
Callinectes sp	1.57	73	0.60	
Galeus polli	1.30	18	0.49	
Todarodes sagittatus	1.04	13	0.40	
Shrimps, small, non coh.	0.78	196	0.30	
Helicolenus dactylopterus	0.78	47	0.30	
Sufflogobius bibarbatu	0.26	65	0.10	
Total	262.94		100.01	

PROJECT STATION: 450
 DATE: 28/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2146 Long E 1253
 start stop duration
 TIME :06:42:00 07:12:00 30 (min) Purpose code: 3
 LOG :3883.20 3884.60 1.40 Area code : 2
 FDEPTH: 305 300 GearCond.code:
 BDEPTH: 305 300 Validity code:
 Towing dir: 63° Wire out: 1000 m Speed: 28 kn*10
 Sorted: Kg Total catch: 119.00 CATCH/HOUR: 238.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	152.80	176	64.20	203
Lophius upsicephalus	37.00	10	15.55	
Trachurus capensis	20.00	60	8.40	
Merluccius capensis male	13.20	26	5.55	202
Heptranchias perlo	10.00	2	4.20	
Hoplostethus melanopus	1.00	60	0.42	
Helicolenus dactylopterus	1.00	50	0.42	
Coelorinchus fasciatus	1.00	50	0.42	
Chlorophthalmus punctatus	1.00	80	0.42	
Galeus polli	1.00	20	0.42	
Todarodes sagittatus	0.00	10		
Sufflogobius bibarbatu	0.00	10		
MYCTOPHIDAE	0.00	10		
Total	238.00		100.00	

PROJECT STATION: 451
 DATE: 28/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2143 Long E 1302
 start stop duration
 TIME :08:29:00 08:59:00 30 (min) Purpose code: 3
 LOG :3894.80 3896.20 1.50 Area code : 2
 FDEPTH: 263 260 GearCond.code:
 BDEPTH: 263 260 Validity code:
 Towing dir: 360° Wire out: 950 m Speed: 28 kn*10
 Sorted: Kg Total catch: 38.50 CATCH/HOUR: 77.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis male	46.60	92	60.52	204
Chlorophthalmus punctatus	11.20	504	14.55	
Merluccius capensis female	5.60	22	7.27	205
Lophius upsicephalus	5.00	4	6.49	
Todarodes sagittatus	2.40	4	3.12	
Trachurus capensis	2.00	8	2.60	
Helicolenus dactylopterus	1.60	112	2.08	
Coelorinchus fasciatus	1.60	24	2.08	
Galeus polli	1.00	4	1.30	
Total	77.00		100.01	

PROJECT STATION: 452
 DATE: 28/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2142 Long E 1307
 start stop duration
 TIME :10:40:00 11:10:00 30 (min) Purpose code: 3
 LOG :3903.70 3907.40 1.60 Area code : 2
 FDEPTH: 199 200 GearCond.code:
 BDEPTH: 199 200 Validity code:
 Towing dir: 360° Wire out: 800 m Speed: 34 kn*10
 Sorted: 98 Kg Total catch: 2546.70 CATCH/HOUR: 8093.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	2600.00	8268	51.05	207
Trachurus capensis	1253.60	1012	24.81	208
Merluccius capensis male	858.40	4316	17.05	206
Chlorophthalmus punctatus	124.80	9724	2.45	
Coelorinchus fasciatus	109.20	3120	2.14	
Pterothrissus belloci	67.60	416	1.33	
Galeus polli	31.20	260	0.61	
Callinectes sp	26.00	832	0.51	
Helicolenus dactylopterus	2.60	260	0.05	
Sufflogobius bibarbatu	0.00	104		
Total	5093.40		100.00	

PROJECT STATION: 453
 DATE: 28/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2139 Long E 1317
 start stop duration
 TIME :12:52:00 13:22:00 30 (min) Purpose code: 3
 LOG :3918.60 3920.20 1.60 Area code : 2
 FDEPTH: 144 144 GearCond.code:
 BDEPTH: 144 144 Validity code:
 Towing dir: 352° Wire out: 650 m Speed: 32 kn*10

Sorted: 111 Kg Total catch: 2444.50 CATCH/HOUR: 4089.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Trachurus capensis	3520.00 49666	72.00	209
Merluccius capensis female	827.20 2068	16.92	
Merluccius capensis male	523.60 3696	10.71	210
Pterothrissus belloci	13.20 88	0.27	
Coelorrhinus fasciatus	4.40 88	0.09	
Sufflogobius bibarbatus	0.40 400	0.01	
Todaropsis eblanae	0.20 40		
Total	4889.00	100.00	

PROJECT STATION: 454
 DATE: 28/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2134 Long E 1330
 start stop duration
 TIME :15:18:00 15:23:00 5 (min) Purpose code: 3
 LOG :3935.30 3935.56 0.23 Area code : 2
 FDEPTH: 108 109 GearCond.code:
 BDEPTH: 108 109 Validity code: 9
 Towing dir: 354° Wire out: 400 m Speed: 31 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
N O C A T C H	0.00		
Total			

PROJECT STATION: 455
 DATE: 28/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2131 Long E 1300
 start stop duration
 TIME :21:20:00 21:50:00 30 (min) Purpose code: 2
 LOG :3989.30 3990.80 1.50 Area code : 2
 FDEPTH: 254 252 GearCond.code:
 BDEPTH: 254 252 Validity code: 2
 Towing dir: 360° Wire out: 900 m Speed: 30 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Total			

PROJECT STATION: 456
 DATE: 29/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2131 Long E 1232
 start stop duration
 TIME :01:25:00 01:55:00 30 (min) Purpose code: 3
 LOG :4021.40 4022.80 1.52 Area code : 2
 FDEPTH: 559 552 GearCond.code:
 BDEPTH: 559 552 Validity code:
 Towing dir: 170° Wire out: 1550 m Speed: 28 kn*10

Sorted: 29 Kg Total catch: 214.50 CATCH/HOUR: 429.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Trachyrhinus scabrurus	141.60 624	23.01	
Lamprogrammus exultus	94.80 216	22.10	
Hoplostethus melanopus	63.60 1176	14.83	
Centrophorus squamosus	51.00 4	11.89	
Merluccius paradoxus female	19.20 22	4.48	212
Nezumia milleri	16.00 564	3.92	
Raja caudaspinosa	7.20 12	1.68	
Notacanthus sexspinis	7.20 144	1.68	
Hydrolagus mirabilis	6.00 12	1.40	
Ocania profundorum	4.80 12	1.12	
MAJIDAE	4.20 6	0.98	
Geryon maritae	3.60 2	0.89	
Prædiplosinus gracilis	2.40 12	0.56	
Talismania longifilis	2.40 72	0.56	
Ebianna costacarinaria	2.40 24	0.56	
Bathyracconger vicinus	1.00 12	0.23	
Selachophidium guentheri	0.60 12	0.14	
Total	429.00	100.03	

PROJECT STATION: 457
 DATE: 29/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2126 Long E 1235
 start stop duration
 TIME :03:28:00 03:58:00 30 (min) Purpose code: 3
 LOG :4032.10 4033.70 1.40 Area code : 2
 FDEPTH: 450 450 GearCond.code:
 BDEPTH: 450 450 Validity code:
 Towing dir: 360° Wire out: 1300 m Speed: 32 kn*10

Sorted: 23 Kg Total catch: 159.00 CATCH/HOUR: 318.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Trachyrhinus scabrurus	172.40	38.49	
Hoplostethus melanopus	76.80 1680	24.15	
Nezumia milleri	22.80 948	7.17	
Helicolenus dactylopterus	22.80 24	7.17	
Centrophorus squamosus	20.40 4	6.42	
Plesionika martia	18.00	5.66	
Merluccius paradoxus female	8.20 10	2.58	213
MYCTOPHIDAE	4.80	1.51	
Epigonus pardionis	4.80 108	1.51	
Todarodes sagittatus	4.80 36	1.51	
Geryon maritae	3.60 4	1.13	
Lophius upsicephalus	2.60 4	0.82	
Aristeus varidens	1.80 528	0.57	
Galeus polli	0.96 12	0.30	
Nemichthys scolopacea	0.60 12	0.19	
Raja caudaspinosa	0.60 12	0.19	
Yarella blackfordi	0.60 36	0.19	
Notacanthus atlantica	0.60 12	0.19	
Notacanthus sexspinis	0.36 12	0.11	
Bathyracconger vicinus	0.24 12	0.08	
Lamprogrammus exultus	0.24 24	0.08	
Total	318.00	100.02	

PROJECT STATION: 458
 DATE: 29/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2122 Long E 1248
 start stop duration
 TIME :06:46:00 07:16:00 30 (min) Purpose code: 3
 LOG :4049.40 4050.90 1.50 Area code : 2
 FDEPTH: 321 321 GearCond.code:
 BDEPTH: 321 321 Validity code:
 Towing dir: 360° Wire out: 1050 m Speed: 30 kn*10

Sorted: Kg Total catch: 150.00 CATCH/HOUR: 300.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	160.00 160	53.33	215
Hoplostethus melanopus	32.00 1216	10.67	
Merluccius capensis male	24.00 50	8.00	214
Chlorophthalmus punctatus	20.00 736	6.67	
Plesionika martia	18.00	5.33	
Lophius upsicephalus	14.00 16	4.67	
Todarodes sagittatus	8.00 40	2.67	
Galeus polli	8.00 336	2.67	
Aristeus varidens	8.00	2.67	
Coelorrhinus fasciatus	4.00 280	1.33	
Trachurus capensis	2.20 10	0.73	
Helicolenus dactylopterus	1.60 168	0.53	
Trachyrhinus scabrurus	0.80 8	0.27	
Ophichthus serpens	0.00 2		
Callinectes sp	0.00 2		
MYCTOPHIDAE	0.00 24		
Total	300.20	100.06	

PROJECT STATION: 459
 DATE: 29/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2120 Long E 1258
 start stop duration
 TIME :08:44:00 09:16:00 32 (min) Purpose code: 3
 LOG :4062.60 4064.10 1.60 Area code : 2
 FDEPTH: 250 251 GearCond.code:
 BDEPTH: 250 251 Validity code:
 Towing dir: 360° Wire out: 900 m Speed: 30 kn*10

Sorted: 101 Kg Total catch: 462.00 CATCH/HOUR: 866.25

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis female	656.25 960	75.76	217
Merluccius capensis male	112.50 324	12.99	216
Trachurus capensis	37.50 178	4.33	218
Chlorophthalmus punctatus	23.44 966	2.71	
Zu elongatus	16.88 6	1.95	
Squalus megalops	4.69 2	0.54	
Galeus polli	4.69 47	0.54	
Neoharriotta pinnata	2.81 2	0.32	
Cynoglossus capensis	1.88 2	0.22	
Callinectes sp	1.88 84	0.22	
Solenocera africana	0.94 84	0.11	
Helicolenus dactylopterus	0.94 131	0.11	
Pterothrissus belloci	0.94 9	0.11	
Sufflogobius bibarbatus	0.94 169	0.11	
Coelorrhinus fasciatus	0.94 38	0.11	
Total	867.22	100.13	

PROJECT STATION: 460
 DATE: 29/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2120 Long E 1302
 start stop duration
 TIME :10:33:00 11:03:00 30 (min) Purpose code: 3
 LOG :4073.50 4074.70 1.50 Area code : 2
 FDEPTH: 101 187 GearCond.code:
 BDEPTH: 181 187 Validity code:
 Towing dir: 360° Wire out: 800 m Speed: 24 kn*10

Sorted: 95 Kg Total catch: 1753.00 CATCH/HOUR: 3506.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Trachurus capensis	3060.00 47968	87.28	221
Merluccius capensis female	180.00 660	5.13	220
Merluccius capensis male	126.00 800	3.59	219
Chlorophthalmus punctatus	60.00 6080	1.71	
Coelorrhinus fasciatus	40.00 1080	1.14	
Callinectes sp	16.00 520	0.46	
Lophius upsicephalus	12.00 80	0.34	
Synegrops microlepis	4.00 480	0.11	
Lepidopus caudatus	4.00 4	0.11	
Galeus polli	4.00 80	0.11	
Todarodes sagittatus	0.00 80		
Merluccius capensis juveniles	0.00 80		
Helicolenus dactylopterus	0.00 80		
Sufflogobius bibarbatus	0.00 360		
Total	3506.00	99.98	

PROJECT STATION: 461
 DATE: 29/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2056 Long E 1257
 start stop duration
 TIME :14:44:00 15:14:00 30 (min) Purpose code: 3
 LOG :4115.40 4116.96 1.40 Area code : 2
 FDEPTH: 177 185 GearCond.code:
 BDEPTH: 177 185 Validity code:
 Towing dir: 160° Wire out: 700 m Speed: 32 kn*10

Sorted: 70 Kg Total catch: 385.50 CATCH/HOUR: 771.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP. NO.
	weight numbers		
Merluccius capensis male	389.40 1948	50.51	223
Merluccius capensis female	321.20 1166	41.66	224
Trachurus capensis	18.70 166	2.23	
Pterothrissus belloci	17.60 88	2.48	
Sufflogobius bibarbatus	12.10 1738	1.57	
Perulibatrachus possignoli	4.40 12	0.42	
Scorpaenopsis japonica	3.20 2	0.42	
Coelorrhinus fasciatus	2.20 44	0.28	
Chlorophthalmus punctatus	0.66 66	0.09	
Synegrops microlepis	0.66 88	0.09	
Raja caudaspinosa	0.44 12	0.06	
Callinectes sp	0.44 34	0.06	
Total	771.00	100.03	

PROJECT STATION: 462
 DATE: 29/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2058 Long E 1251
 start stop duration Purpose code: 3
 TIME :16:16:00 16:46:00 30 (min) Area code : 2
 LOG :4125.80 4127.40 1.60 GearCond.code:
 FDEPTH: 275 276 Validity code:
 BDEPTH: 275 276
 Towing dir: 350° Wire out: 950 m Speed: 32 kn*10
 Sorted: 98 Kg Total catch: 193.30 CATCH/HOUR: 386.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	243.60	560	63.01	226
Merluccius capensis male	37.60	116	9.73	225
Chlorophthalmus punctatus	22.80	928	5.90	
Pterothrissus belloci	21.60	112	5.59	
Lophius upsicephalus	19.60	24	5.07	
Trachurus capensis	15.60	64	4.04	227
Todarodes sagittatus	7.60	8	1.97	
Krill	4.00		1.03	
Neoharriotta pinnata	3.40	2	0.88	
Galeus polli	2.80	32	0.72	
Solenocera africana	1.60	204	0.41	
Coelorinchus fasciatus	1.60	28	0.41	
Sufflogobius bibarbatus	1.60	220	0.41	
Callinectes sp	1.60	40	0.41	
Helicolenus dactylopterus	1.20	168	0.31	
Ophichrus serpens	0.40	4	0.10	
Total	386.60		99.99	

PROJECT STATION: 466
 DATE: 30/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2039 Long E 1217
 start stop duration Purpose code: 3
 TIME :06:41:00 07:11:00 30 (min) Area code : 2
 LOG :4197.60 4199.00 1.41 GearCond.code:
 FDEPTH: 352 350 Validity code:
 BDEPTH: 352 350
 Towing dir: 315° Wire out: 1050 m Speed: 28 kn*10
 Sorted: 102 Kg Total catch: 128.60 CATCH/HOUR: 257.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	80.00	166	31.10	233
Merluccius capensis male	57.60	130	22.40	234
Helicolenus dactylopterus	27.60	726	10.73	
Merluccius paradoxus female	20.00	28	7.78	235
Lophius upsicephalus	16.00	12	6.22	
Todarodes sagittatus	15.00	228	5.83	
Coelorinchus fasciatus	13.80	342	5.37	
Plesionika martia	6.20		2.41	
Schedophilus huttoni	6.20	2	2.41	
Galeus polli	5.00	72	1.94	
Solenocera africana	3.80		1.48	
Epigonus pandionis	3.80	258	1.48	
Chlorophthalmus punctatus	1.20	36	0.47	
Trachurus capensis	0.40	6	0.16	
Beryx splendens	0.20	2	0.08	
Hoplostethus melanopus	0.20	18	0.08	
Callinectes sp	0.20	10	0.08	
MYCTOPHIDAE	0.00	6		
Total	257.20		100.02	

PROJECT STATION: 463
 DATE: 29/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2056 Long E 1245
 start stop duration Purpose code: 3
 TIME :17:42:00 18:12:00 30 (min) Area code : 2
 LOG :4133.30 4134.90 1.50 GearCond.code:
 FDEPTH: 321 320 Validity code:
 BDEPTH: 321 320
 Towing dir: 340° Wire out: 1050 m Speed: 32 kn*10
 Sorted: 104 Kg Total catch: 208.60 CATCH/HOUR: 417.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	316.00	404	75.74	229
Merluccius capensis male	56.80	128	13.61	228
Schedophilus huttoni	18.00	6	4.31	
Hoplostethus melanopus	4.00	108	0.96	
Plesionika martia	4.00		0.96	
Trachurus capensis	4.00	24	0.96	
Todarodes sagittatus	4.00	20	0.96	
Galeus polli	2.00	64	0.48	
Solenocera africana	2.00		0.48	
Coelorinchus fasciatus	2.00	56	0.48	
Chlorophthalmus punctatus	2.00	52	0.48	
Helicolenus dactylopterus	1.60	172	0.38	
Lophius upsicephalus	0.80	12	0.19	
Total	417.20		99.99	

PROJECT STATION: 467
 DATE: 30/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2434 Long E 1229
 start stop duration Purpose code: 3
 TIME :08:46:00 09:16:00 30 (min) Area code : 2
 LOG :4212.30 4213.60 1.40 GearCond.code:
 FDEPTH: 308 307 Validity code:
 BDEPTH: 308 307
 Towing dir: 90° Wire out: 1000 m Speed: 26 kn*10
 Sorted: 96 Kg Total catch: 384.00 CATCH/HOUR: 768.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	544.00	960	70.83	237
Merluccius capensis male	160.00	440	20.83	236
Trachurus capensis	49.60	240	6.46	238
Todarodes sagittatus	7.20	8	0.94	
Chlorophthalmus punctatus	2.80	112	0.36	
Helicolenus dactylopterus	2.00	88	0.26	
Galeus polli	1.20	16	0.16	
Coelorinchus fasciatus	0.80	10	0.10	
Callinectes sp	0.20	8	0.03	
Plesionika martia	0.00	16		
Solenocera africana	0.00	32		
MYCTOPHIDAE	0.00	8		
Total	767.80		99.97	

PROJECT STATION: 464
 DATE: 29/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2056 Long E 1245
 start stop duration Purpose code: 2
 TIME :20:00:00 20:30:00 30 (min) Area code : 2
 LOG :4139.30 4140.90 1.50 GearCond.code:
 FDEPTH: 322 322 Validity code:
 BDEPTH: 322 322
 Towing dir: 345° Wire out: 1050 m Speed: 32 kn*10
 Sorted: 81 Kg Total catch: 202.25 CATCH/HOUR: 404.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	315.00	436	77.87	231
Merluccius capensis male	65.00	156	16.07	230
Lophius upsicephalus	12.50	20	3.09	
Coelorinchus fasciatus	2.50	96	0.62	
Todarodes sagittatus	2.50	10	0.62	
Galeus polli	2.50	66	0.62	
Shrimps, small, non comm.	1.00		0.25	
Solenocera africana	1.00		0.25	
Chlorophthalmus punctatus	1.00	46	0.25	
Hoplostethus melanopus	1.00	36	0.25	
Helicolenus dactylopterus	0.50	76	0.12	
MYCTOPHIDAE	0.00	16		
Callinectes sp	0.00	6		
Total	404.50		100.01	

PROJECT STATION: 468
 DATE: 30/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2032 Long E 1239
 start stop duration Purpose code: 3
 TIME :10:48:00 11:16:00 28 (min) Area code : 2
 LOG :4224.90 4226.60 1.50 GearCond.code:
 FDEPTH: 263 265 Validity code:
 BDEPTH: 263 265
 Towing dir: 315° Wire out: 950 m Speed: 34 kn*10
 Sorted: 104 Kg Total catch: 323.70 CATCH/HOUR: 693.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	377.36	662	54.40	240
Merluccius capensis male	151.07	405	21.78	239
Trachurus capensis	65.57	354	9.45	241
Lophius upsicephalus	32.57	26	4.70	
Pterothrissus belloci	31.50	186	4.54	
Neoharriotta pinnata	24.43	4	3.52	
Chlorophthalmus punctatus	5.79	238	0.83	
Coelorinchus fasciatus	1.93	26	0.28	
Galeus polli	1.93	19	0.28	
Lepidopus caudatus	0.64	6	0.09	
Helicolenus dactylopterus	0.26	19	0.04	
Sufflogobius bibarbatus	0.19	26	0.03	
Callinectes sp	0.19	13	0.03	
Total	693.43		99.97	

PROJECT STATION: 465
 DATE: 30/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2040 Long E 1212
 start stop duration Purpose code: 3
 TIME :01:19:00 01:49:00 30 (min) Area code : 2
 LOG :4177.20 4178.60 1.40 GearCond.code:
 FDEPTH: 452 452 Validity code:
 BDEPTH: 452 452
 Towing dir: 325° Wire out: 1300 m Speed: 28 kn*10
 Sorted: 23 Kg Total catch: 188.53 CATCH/HOUR: 377.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Hoplostethus melanopus	208.60	7136	55.32	
Trachyrhinus scabrus	82.60	602	21.91	
Centroporus squamosus	47.20	8	12.52	
Nezumia milleri	15.40	546	4.08	
Merluccius paradoxus female	9.80	12	2.60	232
Todarodes sagittatus	8.40	28	2.23	
MYCTOPHIDAE	1.40	196	0.37	
Schedophilus huttoni	1.00	2	0.27	
Plesionika martia	0.98	532	0.26	
Lepidopus caudatus	0.70	14	0.19	
Psychrolutes macrocephalus	0.56	28	0.15	
Epigonus pandionis	0.42	14	0.11	
Total	377.06		100.01	

PROJECT STATION: 469
 DATE: 30/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2016 Long E 1239
 start stop duration Purpose code: 3
 TIME :14:34:00 14:54:00 20 (min) Area code : 2
 LOG :4259.60 4260.70 1.08 GearCond.code:
 FDEPTH: 142 140 Validity code:
 BDEPTH: 142 140
 Towing dir: 150° Wire out: 650 m Speed: 33 kn*10
 Sorted: 75 Kg Total catch: 989.10 CATCH/HOUR: 2967.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	1454.70	4953	49.02	243
Trachurus capensis	924.30	10362	31.15	244
Merluccius capensis male	370.50	1677	12.49	242
Chelidonichthys capensis	62.40	234	2.10	
Squalus megalops	42.90	234	1.45	
Pterothrissus belloci	31.20	234	1.05	
Dentex macrocephalus	31.20	234	1.05	
Austroglossus microlepis	23.40	39	0.79	
Mustelus mustelus	22.80	3	0.77	
Callinectes sp	1.95	78	0.07	
Synagrops microlepis	1.95	156	0.07	
Total	2967.30		100.01	

PROJECT STATION: 470
 DATE: 30/ 9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2013 Long E 1232
 start stop duration Purpose code: 3
 TIME :16:25:00 16:55:00 30 (min) Area code : 2
 LOG :4273.00 4274.50 1.50 GearCond.code:
 FDEPTH: 181 181 Validity code:
 BDEPTH: 181 181
 Towing dir: 340° Wire out: 750 m Speed: 30 kn*10
 Sorted: 71 Kg Total catch: 713.00 CATCH/HOUR: 1426.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	748.00	3420	52.45	246
Merluccius capensis male	580.00	2920	40.67	245
Trachurus capensis	68.00	700	4.77	247
Pterothrissus belloci	18.00	140	1.26	
Squalus megalops	8.00	20	0.56	
Coelorinchus fasciatus	2.00	40	0.14	
Sufflogobius bibarbatus	2.00	180	0.14	
Total	1426.00		99.99	

PROJECT STATION: 471
 DATE: 30/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2010 Long E 1224
 TIME :18:10:00 18:30:00 20 (min) Purpose code: 3
 LOG :4285.10 4285.90 0.90 Area code : 2
 FDEPTH: 241 239 GearCond.code: 2
 BDEPTH: 241 239 Validity code:
 Towing dir: 330° Wire out: 850 m Speed: 24 kn*10
 Sorted: 83 Kg Total catch: 593.00 CATCH/HOUR: 1779.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	675.00	1854	37.94	249
Pterothrissus bellioi	396.00	2415	22.26	
Merluccius capensis male	270.00	972	15.18	248
Trachurus capensis	189.00	1134	10.62	250
Neoharriotta pinnata	108.00	72	6.07	
Lophius upsicephalus	54.00	108	3.04	
Cynoglossus capensis	54.00	108	3.04	
Coelorinchus fasciatus	25.20	432	1.42	
Sufflogobius bibarbatatus	4.20	468	0.24	
Galeus polli	2.10	72	0.12	
Chlorophthalmus punctatus	0.60	144	0.03	
Callinectes sp	0.60	36	0.03	
Total	1778.70		99.99	

PROJECT STATION: 475
 DATE: 1/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1947 Long E 1210
 TIME :12:49:00 13:14:00 25 (min) Purpose code: 3
 LOG :4368.00 4369.40 1.40 Area code : 3
 FDEPTH: 282 255 GearCond.code: 2
 BDEPTH: 252 255 Validity code:
 Towing dir: 345° Wire out: 900 m Speed: 33 kn*10
 Sorted: 82 Kg Total catch: 369.65 CATCH/HOUR: 887.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	486.60	1318	56.00	259
Merluccius capensis male	225.72	778	25.44	258
Pterothrissus bellioi	103.68	725	11.69	
Trachurus capensis	30.24	151	3.41	260
Chlorophthalmus punctatus	8.64	302	0.97	
Dentex macrophthalus	8.64	22	0.97	
Synagrops microlepis	6.40	497	0.73	
Lophius upsicephalus	4.80	12	0.54	
Coelorinchus fasciatus	1.08	34	0.12	
Sufflogobius bibarbatatus	1.08	173	0.12	
Nemichthys scolopacea	0.00	12		
Total	887.16		99.99	

PROJECT STATION: 472
 DATE: 30/9/90 GEAR TYPE: BT No:1 POSITION: Lat S 2013 Long E 1213
 TIME :20:07:00 20:37:00 30 (min) Purpose code: 3
 LOG :4298.00 4299.40 1.50 Area code : 2
 FDEPTH: 285 284 GearCond.code: 2
 BDEPTH: 285 284 Validity code:
 Towing dir: 330° Wire out: 1000 m Speed: 28 kn*10
 Sorted: 96 Kg Total catch: 286.00 CATCH/HOUR: 572.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	210.00	558	36.71	252
Merluccius capensis male	198.00	618	34.62	251
Trachurus capensis	120.00	708	20.98	253
Chlorophthalmus punctatus	16.20	762	2.83	
Galeus polli	12.00	96	2.10	
Helicolenus dactylopterus	5.40	462	0.94	
Solenocera africana	4.20	462	0.73	
Pterothrissus bellioi	3.00	18	0.52	
Callinectes sp	2.40	48	0.42	
Lepidopus caudatus	1.20	6	0.21	
Coelorinchus fasciatus	1.00	30	0.17	
Sufflogobius bibarbatatus	0.60	96	0.10	
Lophius upsicephalus	0.00	6		
Total	572.00		100.33	

PROJECT STATION: 476
 DATE: 1/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1946 Long E 1217
 TIME :15:11:00 15:41:00 30 (min) Purpose code: 3
 LOG :4382.10 4383.80 1.70 Area code : 3
 FDEPTH: 202 205 GearCond.code: 2
 BDEPTH: 202 205 Validity code:
 Towing dir: 338° Wire out: 750 m Speed: 34 kn*10
 Sorted: 79 Kg Total catch: 1188.40 CATCH/HOUR: 2376.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	1251.00	4680	52.63	262
Merluccius capensis male	639.00	2940	26.88	261
Trachurus capensis	378.00	3450	15.90	263
Pterothrissus bellioi	84.00	690	3.53	
Callinectes sp	9.00	240	0.38	
Synagrops microlepis	8.40	960	0.35	
Raja miraletus	2.00	2	0.08	
Sufflogobius bibarbatatus	1.80	300	0.08	
Coelorinchus fasciatus	1.50	30	0.06	
Squalus megalops	1.00	2	0.04	
Hyperoglyphe mosellii	0.80	2	0.03	
MYCTOPHIDAE	0.30		0.01	
Total	2376.80		99.97	

PROJECT STATION: 473
 DATE: 1/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1958 Long E 1143
 TIME :07:14:00 07:44:00 30 (min) Purpose code: 3
 LOG :4331.10 4332.70 1.60 Area code : 3
 FDEPTH: 500 499 GearCond.code: 2
 BDEPTH: 500 499 Validity code:
 Towing dir: 340° Wire out: 1500 m Speed: 32 kn*10
 Sorted: 26 Kg Total catch: 219.20 CATCH/HOUR: 438.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachyrinus scabrus	192.00	1020	43.80	
Hoplostethus melanopus	110.00	4600	25.09	
Yarella blackfordi	52.00	7834	11.86	
Merluccius paradoxus female	20.00	24	4.56	255
Nezumia willeri	18.00	1040	4.11	
Plesionika martia	14.00	60	3.19	
Todarodes saxitatus	10.00	20	2.28	
Schedophilus huttoni	10.00	20	2.28	
Helicolenus dactylopterus	10.00	20	2.28	
Aristeus varidens	2.00	22	0.46	
Callinectes sp	2.00	20	0.09	
Lyconus pinnatus	0.00			
Etmopterus pusillus	0.00			
Epigonus pandionis	0.00			
Psychrolutes macrocephalus	0.00			
Bathyrconger vicinus	0.00			
Nemichthys scolopacea	0.00			
Galeus polli	0.00	60		
Total	438.20		100.00	

PROJECT STATION: 477
 DATE: 1/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1942 Long E 1225
 TIME :17:04:00 17:24:00 20 (min) Purpose code: 3
 LOG :4395.50 4396.50 1.00 Area code : 3
 FDEPTH: 141 144 GearCond.code: 2
 BDEPTH: 141 144 Validity code:
 Towing dir: 340° Wire out: 650 m Speed: 30 kn*10
 Sorted: 6 Kg Total catch: 6500.00 CATCH/HOUR: 19500.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachurus capensis	1950.00	422499	100.00	264
Thyrastis atus	0.00	3		
Merluccius capensis	0.00			
Total	1950.00		100.00	

PROJECT STATION: 478
 DATE: 1/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1939 Long E 1222
 TIME :19:21:00 19:28:00 7 (min) Purpose code: 3
 LOG :4406.10 4406.40 0.20 Area code : 3
 FDEPTH: 124 126 GearCond.code: 9
 BDEPTH: 124 126 Validity code: 9
 Towing dir: 250° Wire out: 600 m Speed: 30 kn*10
 Sorted: 11 Kg Total catch: 11.21 CATCH/HOUR: 96.09

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	51.43	214	53.52	266
Merluccius capensis juveniles	21.43	334	22.30	267
Merluccius capensis male	17.14	120	17.84	265
Trachurus capensis	4.29	51	4.46	268
Sardinops ocellata	0.86	9	0.89	
Cynoglossus capensis	0.77	9	0.80	
Sufflogobius bibarbatatus	0.17	9	0.18	
Total	96.09		99.99	

PROJECT STATION: 474
 DATE: 1/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1950 Long E 1204
 TIME :11:06:00 11:36:00 30 (min) Purpose code: 3
 LOG :4357.60 4359.20 1.50 Area code : 3
 FDEPTH: 301 300 GearCond.code: 2
 BDEPTH: 301 300 Validity code:
 Towing dir: 360° Wire out: 1000 m Speed: 32 kn*10
 Sorted: 68 Kg Total catch: 259.98 CATCH/HOUR: 519.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	289.80	680	55.74	257
Merluccius capensis male	139.20	428	28.79	256
Helicolenus dactylopterus	32.00	4060	6.25	
Chlorophthalmus punctatus	15.00	1280	3.08	
Pterothrissus bellioi	11.90	56	2.29	
Lophius upsicephalus	9.80	8	1.88	
Galeus polli	8.00	120	1.54	
Trachurus capensis	4.20	14	0.81	
Synagrops microlepis	4.00	360	0.77	
Sufflogobius bibarbatatus	2.00	280	0.38	
Solenocera africana	1.96	358	0.38	
Callinectes sp	0.50	8	0.10	
Aristeus varidens	0.28	22	0.05	
Plesionika acanthurus	0.14	28	0.03	
Plesionika martia	0.08	22	0.02	
Total	519.96		100.01	

PROJECT STATION: 479
 DATE: 2/10/90 GEAR TYPE: PT No:6 POSITION: Lat S 1853 Long E 1222
 TIME :05:20:00 05:35:00 15 (min) Purpose code: 1
 LOG :4494.20 4495.10 0.90 Area code : 3
 FDEPTH: 10 10 GearCond.code: 2
 BDEPTH: 47 46 Validity code:
 Towing dir: 150° Wire out: 15 m Speed: 36 kn*10
 Sorted: Kg Total catch: 0.42 CATCH/HOUR: 1.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachurus capensis	1.20	88	71.43	269
Eneraulis capensis	0.40	40	23.81	270
Sardinops ocellata	0.08	8	4.76	
Total	1.68		100.00	

PROJECT STATION: 480
 DATE: 2/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1919 Long E 1213
 start stop duration
 TIME :08:51:00 09:00:00 9 (min) Purpose code: 3
 LOG :4525.00 4525.40 0.50 Area code : 3
 FDEPTH: 180 180 GearCond.code:
 BDEPTH: 180 180 Validity code: 1
 Towing dir: 360° Wire out: 750 m Speed: 30 kn*10

Sorted: 63 Kg Total catch: 387.50 CATCH/HOUR: 2583.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	1360.00	5120	52.65	272
Merluccius capensis male	700.00	3120	27.10	271
Trachurus capensis	336.00	3000	13.01	273
Squalus megalops	60.00	240	2.32	
Sufflogobius bibarbatu	32.00	2320	1.24	
Lophius upsicephalus	29.33	20	1.14	
Pterothrissus bellioi	20.00	280	0.77	
Chetrabus damaranus	12.00	120	0.46	
Synagrops microlepis	12.00	1480	0.46	
Raja mraletus	12.00	20	0.46	
MYCTOPHIDAE	4.00		0.15	
Callinectes sp	4.00	160	0.15	
Coelorinchus fasciatus	2.00	40	0.08	
Total	2583.33		99.99	

PROJECT STATION: 485
 DATE: 2/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1857 Long E 1159
 start stop duration
 TIME :18:37:00 19:07:00 30 (min) Purpose code: 3
 LOG :4594.80 4596.20 1.50 Area code : 3
 FDEPTH: 197 197 GearCond.code:
 BDEPTH: 197 197 Validity code:
 Towing dir: 330° Wire out: 750 m Speed: 28 kn*10

Sorted: 58 Kg Total catch: 317.15 CATCH/HOUR: 634.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	385.00	1144	60.70	287
Merluccius capensis male	176.00	606	27.75	286
Pterothrissus bellioi	27.50	220	4.34	
Trachurus capensis	22.00	176	3.47	
Chlorophthalmus punctatus	11.00	462	1.73	
Dentex macrophthalmus	5.50	22	0.87	
Callinectes sp	2.20	56	0.35	
Austrolosteus microlepis	1.80	2	0.28	
Trigla lyra	1.50	22	0.24	
Chetrabus damaranus	1.10	12	0.17	
Sufflogobius bibarbatu	0.60	156	0.09	
Synagrops microlepis	0.10	22	0.02	
Total	634.30		100.01	

PROJECT STATION: 481
 DATE: 2/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1922 Long E 1206
 start stop duration
 TIME :10:22:00 10:52:00 30 (min) Purpose code: 3
 LOG :4534.30 4535.80 1.50 Area code : 3
 FDEPTH: 239 241 GearCond.code:
 BDEPTH: 239 241 Validity code:
 Towing dir: 355° Wire out: 900 m Speed: 30 kn*10

Sorted: 67 Kg Total catch: 403.90 CATCH/HOUR: 807.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	312.00	840	38.62	275
Trachurus capensis	252.00	2318	31.20	276
Merluccius capensis male	204.00	696	25.25	274
Pterothrissus bellioi	30.00	168	3.71	
Dentex macrophthalmus	6.00	24	0.74	
Austrolosteus microlepis	2.00	2	0.25	
Coelorinchus fasciatus	0.60	12	0.07	
Chlorophthalmus punctatus	0.36	48	0.04	
MYCTOPHIDAE	0.24	84	0.03	
Helicolenus dactylopterus	0.24	60	0.03	
Sufflogobius bibarbatu	0.24	120	0.03	
Synagrops microlepis	0.12	60	0.01	
Solenocera africana	0.00	12		
Total	807.80		99.98	

PROJECT STATION: 486
 DATE: 2/10/90 GEAR TYPE: PT No:6 POSITION: Lat S 1851 Long E 1213
 start stop duration
 TIME :21:50:00 23:05:00 15 (min) Purpose code: 1
 LOG :4629.30 4630.00 0.70 Area code : 3
 FDEPTH: 0 0 GearCond.code:
 BDEPTH: 89 88 Validity code:
 Towing dir: ** Wire out: 200 m Speed: 30 kn*10

Sorted: 2 Kg Total catch: 10.00 CATCH/HOUR: 40.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Trachurus capensis	40.00	1456	100.00	288
Total	40.00		100.00	

PROJECT STATION: 487
 DATE: 3/10/90 GEAR TYPE: PT No:6 POSITION: Lat E 1215
 start stop duration
 TIME :02:54:00 03:07:00 13 (min) Purpose code: 1
 LOG :4659.90 4660.60 0.69 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 45 46 Validity code:
 Towing dir: 144° Wire out: 150 m Speed: 34 kn*10

Sorted: 56 Kg Total catch: 1000.00 CATCH/HOUR: 4615.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Sardinops ocellata	4426.15	56502	95.90	289
Trachurus capensis	189.23	13135	4.10	290
Total	4615.38		100.00	

PROJECT STATION: 482
 DATE: 2/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1927 Long E 1158
 start stop duration
 TIME :12:17:00 12:47:00 30 (min) Purpose code: 3
 LOG :4547.40 4549.00 1.52 Area code : 3
 FDEPTH: 296 298 GearCond.code:
 BDEPTH: 296 298 Validity code:
 Towing dir: 340° Wire out: 950 m Speed: 32 kn*10

Sorted: 84 Kg Total catch: 136.27 CATCH/HOUR: 272.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	163.40	264	52.62	278
Merluccius capensis male	72.40	180	26.56	277
Lophius upsicephalus	15.00	18	5.50	
Trachurus capensis	13.00	76	4.77	279
Helicolenus dactylopterus	10.20	828	3.74	
Chlorophthalmus punctatus	7.20	498	2.64	
Synagrops microlepis	4.20	228	1.54	
Coelorinchus fasciatus	3.00	150	1.10	
Galeus polli	3.00	30	1.10	
Solenocera africana	0.54	132	0.20	
Pterothrissus bellioi	0.36	12	0.13	
Callinectes sp	0.24	6	0.09	
S H R I M P S	0.00	12		
Total	272.54		99.99	

PROJECT STATION: 488
 DATE: 3/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1896 Long E 1150
 start stop duration
 TIME :07:29:00 07:54:00 25 (min) Purpose code: 3
 LOG :4701.20 4702.50 1.20 Area code : 3
 FDEPTH: 157 158 GearCond.code:
 BDEPTH: 157 158 Validity code:
 Towing dir: 330° Wire out: 750 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 442.85 CATCH/HOUR: 1062.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	475.20	1829	44.71	292
Merluccius capensis male	259.20	1109	24.39	291
Pterothrissus bellioi	82.08	677	7.72	
Mustelus mustelus	62.40	7	5.67	
Chlorophthalmus punctatus	50.40	4	4.74	
Dentex macrophthalmus	43.20	360	4.06	
Argyrosomus hololepidotus	21.60	14	2.03	
Mustelus palumbes	21.60	10	2.03	
Trachurus capensis	14.40	144	1.35	
Todarodes sagittatus	12.96	14	1.22	
Synagrops microlepis	11.52	821	1.08	
Squalus megalops	6.00	17	0.56	
Helicolenus dactylopterus	1.44	288	0.34	
Callinectes sp	0.72	28	0.07	
Parapandalus brevipes	0.12	168	0.01	
Total	1062.84		99.98	

PROJECT STATION: 483
 DATE: 2/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1903 Long E 1147
 start stop duration
 TIME :15:13:00 15:41:00 28 (min) Purpose code: 3
 LOG :4572.90 4574.20 1.30 Area code : 3
 FDEPTH: 300 300 GearCond.code:
 BDEPTH: 300 300 Validity code:
 Towing dir: 345° Wire out: 1000 m Speed: 28 kn*10

Sorted: 83 Kg Total catch: 123.60 CATCH/HOUR: 264.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	132.86	184	50.16	261
Merluccius capensis male	76.29	71	28.80	260
Helicolenus dactylopterus	30.00	2743	11.39	
Synagrops microlepis	6.57	557	3.24	
Trachurus capensis	7.29	242	2.75	282
Solenocera africana	6.43	1393	2.43	
Chlorophthalmus punctatus	1.71	86	0.65	
MYCTOPHIDAE	1.07	386	0.40	
Sufflogobius bibarbatu	0.84	86	0.24	
Galeus polli	0.09	21	0.03	
Total	264.95		100.03	

PROJECT STATION: 489
 DATE: 3/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1840 Long E 1142
 start stop duration
 TIME :09:19:00 09:49:00 30 (min) Purpose code: 3
 LOG :4713.40 4715.10 1.60 Area code : 3
 FDEPTH: 238 235 GearCond.code:
 BDEPTH: 238 235 Validity code:
 Towing dir: 330° Wire out: 850 m Speed: 34 kn*10

Sorted: 61 Kg Total catch: 309.05 CATCH/HOUR: 618.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	303.00	800	49.02	294
Merluccius capensis male	150.00	430	24.27	293
Pterothrissus bellioi	54.00	320	8.74	
Chlorophthalmus punctatus	50.00	2150	8.09	
Helicolenus dactylopterus	15.00	930	2.43	
Synagrops microlepis	15.00	900	2.43	
Trachurus capensis	9.00	60	1.46	
Lophius upsicephalus	5.00	10	0.81	
Callinectes sp	5.00	190	0.81	
Squalus megalops	4.00	10	0.65	
Hyperoglyphe moselli	3.50	4	0.58	
Dentex macrophthalmus	3.00	10	0.49	
MYCTOPHIDAE	0.60	250	0.10	
Malacocephalus laevis	0.40	30	0.06	
Parapanaeus longirostris	0.30	50	0.05	
Munida sp.	0.10	10	0.02	
Sufflogobius bibarbatu	0.06	10	0.01	
Solenocera africana	0.04	10	0.01	
Total	618.10		100.03	

PROJECT STATION: 484
 DATE: 2/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1900 Long E 1156
 start stop duration
 TIME :17:14:00 17:44:00 30 (min) Purpose code: 3
 LOG :4587.10 4598.60 1.52 Area code : 3
 FDEPTH: 238 239 GearCond.code:
 BDEPTH: 238 239 Validity code:
 Towing dir: 332° Wire out: 850 m Speed: 30 kn*10

Sorted: 61 Kg Total catch: 276.43 CATCH/HOUR: 552.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	342.00	846	61.86	284
Merluccius capensis male	153.00	514	27.67	283
Chlorophthalmus punctatus	18.00	1170	3.26	
Trachurus capensis	18.00	136	3.26	285
Pterothrissus bellioi	13.50	82	2.44	
Helicolenus dactylopterus	6.30	288	1.14	
Sufflogobius bibarbatu	1.80	144	0.33	
Synagrops microlepis	0.10	28	0.02	
Callinectes sp	0.10	10	0.02	
Solenocera africana	0.06	20	0.01	
Total	552.86		100.01	

PROJECT STATION: 490
 DATE: 3/10/90 GEAR TYPE: PT No:2 POSITION: Lat S 1838 Long E 1134
 start stop duration
 TIME :11:20:00 12:02:00 42 (min) Purpose code: 2
 LOG :4723.50 4724.50 1.00 Area code : 3
 FDEPTH: 170 200 GearCond.code:
 BDEPTH: 230 229 Validity code:
 Towing dir: 340° Wire out: 550 m Speed: 15 kn*10
 Sorted: 77 Kg Total catch: 270.70 CATCH/HOUR: 386.71

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
	weight numbers		
Trachurus capensis	285.71	6253	73.88 297
Merluccius capensis female	62.43	160	16.14 296
Merluccius capensis male	27.57	87	7.13 295
Thysites atun	11.00	9	2.84
Lepidopus caudatus	0.00	1	
Total	386.71	99.99	

PROJECT STATION: 491
 DATE: 3/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1838 Long E 1127
 start stop duration
 TIME :13:23:00 13:53:00 30 (min) Purpose code: 3
 LOG :4733.10 4734.70 1.53 Area code : 3
 FDEPTH: 294 297 GearCond.code:
 BDEPTH: 294 297 Validity code:
 Towing dir: 15° Wire out: 950 m Speed: 32 kn*10
 Sorted: 77 Kg Total catch: 292.15 CATCH/HOUR: 584.30

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
	weight numbers		
Merluccius capensis female	327.20	656	56.00 299
Merluccius capensis male	100.80	344	17.25 298
Solenocera africana	44.00	7	7.53
Helicolenus dactylopterus	39.00	1660	6.67
Chlorophthalmus punctatus	14.00	490	2.40
Todarodes sagittatus	12.00	40	2.05
Synagrops microlepis	11.00	760	1.88
Schedophilus huttoni	9.80	4	1.68
Histioteuthis reversa	8.00	240	1.37
Galeus polli	7.00	110	1.20
Trachurus capensis	4.00	40	0.68
Coelorinchus fasciatus	4.00	130	0.68
Hoplostethus melanopus	3.00	70	0.51
Munida sp.	0.50	70	0.09
Total	584.30	99.99	

PROJECT STATION: 492
 DATE: 3/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1815 Long E 1130
 start stop duration
 TIME :16:17:00 16:47:00 30 (min) Purpose code: 3
 LOG :4758.00 4759.70 1.52 Area code : 3
 FDEPTH: 299 300 GearCond.code:
 BDEPTH: 299 300 Validity code:
 Towing dir: 10° Wire out: 1000 m Speed: 34 kn*10
 Sorted: 92 Kg Total catch: 228.10 CATCH/HOUR: 456.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
	weight numbers		
Merluccius capensis female	124.60	210	27.31 301
Helicolenus dactylopterus	114.00	2700	24.99
Merluccius capensis male	42.80	92	9.38 300
Solenocera africana	39.60	1920	8.68
Physiculus capensis	36.00	480	7.89
Chlorophthalmus punctatus	25.80	120	5.66
Hoplostethus melanopus	24.00	1080	5.26
Coelorinchus polli	24.00	420	5.26
Galeus polli	18.00	120	3.95
Trachurus capensis	7.40	34	1.62 302
Total	456.20	100.00	

PROJECT STATION: 493
 DATE: 3/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1813 Long E 1133
 start stop duration
 TIME :17:39:00 18:11:00 32 (min) Purpose code: 3
 LOG :4764.80 4766.70 1.70 Area code : 3
 FDEPTH: 221 218 GearCond.code:
 BDEPTH: 221 218 Validity code:
 Towing dir: 10° Wire out: 850 m Speed: 36 kn*10
 Sorted: 111 Kg Total catch: 920.40 CATCH/HOUR: 1725.75

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
	weight numbers		
Merluccius capensis female	823.50	1155	47.72 304
Chlorophthalmus punctatus	315.00	11760	18.25
Merluccius capensis male	228.00	540	13.21 303
Helicolenus dactylopterus	90.00	2464	5.22
Dentex macrophthalms	90.00	495	5.22
Pterothrissus belloci	60.00	375	3.48
Mustelus mustelus	54.94	9	1.56
Synagrops microlepis	27.00	810	3.18
Todarodes sagittatus	18.00	15	1.04
Trigla lyra	12.00	45	0.70
Trachurus capensis	10.50	45	0.61
Coelorinchus polli	3.00	60	0.17
Coelorinchus polli	0.75	105	0.04
Parapandanus longirostris	0.28	15	0.02
Malacocephalus laevis	0.19	30	0.01
Parapandanus brevipes	0.09	15	0.01
Solenocera africana	0.09	15	0.01
Total	1733.25	100.44	

PROJECT STATION: 494
 DATE: 3/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1811 Long E 1138
 start stop duration
 TIME :19:03:00 19:33:00 30 (min) Purpose code: 3
 LOG :4772.10 4774.00 1.65 Area code : 3
 FDEPTH: 150 151 GearCond.code:
 BDEPTH: 150 151 Validity code:
 Towing dir: 360° Wire out: 750 m Speed: 38 kn*10
 Sorted: 58 Kg Total catch: 264.10 CATCH/HOUR: 528.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
	weight numbers		
Merluccius capensis female	126.00	432	23.85 306
Helicolenus dactylopterus	114.30	354	21.64
Trachurus capensis	99.00	766	18.74 308
Merluccius capensis male	48.60	216	9.20 305
Trigla lyra	45.90	208	8.69
Pterothrissus belloci	35.10	288	6.65
Chlorophthalmus punctatus	13.50	1404	2.56
Zeus faber	9.00	28	2.56
Synagrops microlepis	9.00	990	1.70
Dentex macrophthalms	9.00	64	1.70
Merluccius polli	9.00	252	1.70 307
Lepidopus caudatus	3.60	28	0.68
MYCTOPHIDAE	0.60	270	0.11
Ollinectes sp	0.50	26	0.09
Coelorinchus polli	0.40	10	0.08
Arnglossus imperialis	0.10	10	0.02
Squilla mantis	0.10	10	0.02
Total	528.20	99.99	

PROJECT STATION: 495
 DATE: 4/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1750 Long E 1124
 start stop duration
 TIME :06:48:00 07:18:00 30 (min) Purpose code: 3
 LOG :4840.00 4841.40 1.30 Area code : 3
 FDEPTH: 295 280 GearCond.code:
 BDEPTH: 295 280 Validity code:
 Towing dir: 320° Wire out: 1000 m Speed: 28 kn*10
 Sorted: 81 Kg Total catch: 991.20 CATCH/HOUR: 1982.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
	weight numbers		
Merluccius capensis female	700.40	1190	35.33 310
Chlorophthalmus punctatus	416.00	10054	20.98
Helicolenus dactylopterus	390.00	5748	19.67
Merluccius capensis male	367.20	800	18.52 309
Galeus polli	41.60	364	2.10
Coelorinchus polli	31.20	676	1.57
Dentex macrophthalms	18.50	52	0.93
Trachurus capensis	6.80	18	0.34
Merluccius polli	6.80	86	0.34 311
Malacocephalus laevis	2.10	104	0.11
Laenema laevis	1.00	50	0.05
Synagrops microlepis	0.30	60	0.02
Sufflogobius bibarbus	0.30	60	0.02
Total	1982.20	99.98	

PROJECT STATION: 496
 DATE: 4/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1751 Long E 1127
 start stop duration
 TIME :08:25:00 08:55:00 30 (min) Purpose code: 3
 LOG :4848.30 4850.00 1.60 Area code : 3
 FDEPTH: 220 217 GearCond.code:
 BDEPTH: 220 217 Validity code:
 Towing dir: 350° Wire out: 850 m Speed: 34 kn*10
 Sorted: 76 Kg Total catch: 153.40 CATCH/HOUR: 306.80

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
	weight numbers		
Merluccius capensis female	168.00	328	54.76 313
Merluccius capensis male	92.00	236	29.99 312
Chlorophthalmus punctatus	13.20	610	4.30
Trachurus capensis	11.60	188	3.78 315
Helicolenus dactylopterus	7.60	244	2.48
Todarodes sagittatus	7.20	12	2.35
Parapandanus brevipes	1.80	496	0.59
Synagrops microlepis	1.60	100	0.52
Parapandanus longirostris	1.40	180	0.46
Munida sp.	1.00	72	0.33
Merluccius polli	0.80	16	0.26 314
Callinectes sp	0.60	16	0.20
Total	306.80	100.02	

PROJECT STATION: 497
 DATE: 4/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1730 Long E 1122
 start stop duration
 TIME :13:52:00 14:22:00 30 (min) Purpose code: 3
 LOG :4890.70 4892.20 1.55 Area code : 3
 FDEPTH: 307 305 GearCond.code:
 BDEPTH: 307 305 Validity code:
 Towing dir: 24° Wire out: 1000 m Speed: 30 kn*10
 Sorted: 108 Kg Total catch: 451.92 CATCH/HOUR: 903.84

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
	weight numbers		
Merluccius capensis male	477.60	728	52.84 316
Merluccius capensis female	263.20	336	29.12 317
Dentex macrophthalms	67.20	224	7.43
Chlorophthalmus punctatus	43.20	1040	4.78
Helicolenus dactylopterus	17.60	288	1.95
Galeus polli	14.40	64	1.59
Todarodes sagittatus	7.20	16	0.80
Trachurus capensis	7.20	32	0.80
Hyperoglyphe moselii	3.20	6	0.35
Physiculus capensis	2.08	32	0.23
Coelorinchus fasciatus	0.48	32	0.05
Synagrops microlepis	0.32	208	0.04
Munida sp.	0.16	48	0.02
Total	903.84	100.00	

PROJECT STATION: 498
 DATE: 4/10/90 GEAR TYPE: BT No:1 POSITION: Lat S 1720 Long E 1120
 start stop duration
 TIME :15:49:00 16:19:00 30 (min) Purpose code: 3
 LOG :4903.50 4905.10 1.54 Area code : 3
 FDEPTH: 354 356 GearCond.code:
 BDEPTH: 354 356 Validity code:
 Towing dir: 192° Wire out: 1100 m Speed: 32 kn*10
 Sorted: 73 Kg Total catch: 312.30 CATCH/HOUR: 624.60

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP.NO.
	weight numbers		
Merluccius capensis female	395.20	714	63.27 319
Merluccius capensis male	109.60	208	17.55 318
Helicolenus dactylopterus	23.20	168	3.71
Chlorophthalmus punctatus	20.80	416	3.33
Todarodes sagittatus	13.60	40	2.18
Neoharriotta pinnata	13.20	4	2.11
Dentex macrophthalms	12.80	32	2.05
Galeus polli	9.60	128	1.54
Nezumia sp	8.00	248	1.28
Centrolophus niger	7.20	8	1.15
Trachurus capensis	4.80	16	0.77
Centroporus granulatus	3.80	4	0.61
Solenocera africana	2.40	352	0.38
Synagrops microlepis	0.40	24	0.06
Total	624.60	99.99	

DATE: 4/10/90 GEAR TYPE: BT No:1 PROJECT STATION: 499
 start stop duration POSITION: Lat S 1719
 TIME :17:44:00 18:14:00 30 (min) Purpose code: 3 Long E 1125
 LOG :4915.90 4917.50 1.60 Area code : 3
 FDEPTH: 221 222 GearCond.code:
 BDEPTH: 221 222 Validity code:
 Towing dir: 183° Wire out: 850 m Speed: 32 kn*10
 Sorted: 108 Kg Total catch: 539.95 CATCH/HOUR: 1079.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Merluccius capensis female	644.00	1590	59.64	321
Merluccius capensis male	220.00	610	20.37	320
Zenopsis conchifer	40.00	190	3.70	
Pterothrissus belloci	34.00	220	3.15	
MYCTOPHIDAE	34.00	7882	3.15	
Synagrops microlepis	27.00	1728	2.50	
Chlorophthalmus punctatus	23.00	660	2.13	
Trachurus capensis	15.00	200	1.39	323
Todarodes sagittatus	12.00	20	1.11	
Dentex macrophthalmus	10.00	50	0.93	
Helicolenus dactylopterus	9.00	90	0.83	
Merluccius polli	7.00	100	0.65	322
Parapenaeus longirostris	2.50	290	0.23	
Parapandalus brevipes	1.40	400	0.13	
Synapturichthys kloini	0.60	20	0.06	
Symphurus sp	0.40	30	0.04	
Total	1079.90		100.01	

DATE: 4/10/90 GEAR TYPE: BT No:1 PROJECT STATION: 500
 start stop duration POSITION: Lat S 1722
 TIME :19:22:00 19:52:00 30 (min) Purpose code: 3 Long E 1130
 LOG :4925.30 4926.90 1.60 Area code : 3
 FDEPTH: 152 148 GearCond.code:
 BDEPTH: 152 148 Validity code:
 Towing dir: 360° Wire out: 700 m Speed: 32 kn*10
 Sorted: 25 Kg Total catch: 556.00 CATCH/HOUR: 1112.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP. NO.
	weight	numbers		
Dentex macrophthalmus	680.00	7100	61.15	327
Chlorophthalmus punctatus	88.00	4224	7.91	
Merluccius capensis female	70.00	230	6.29	325
Lepidopus caudatus	60.00	160	5.40	
Pterothrissus belloci	40.00	280	3.60	
Trigla lyra	40.00	240	3.60	
Merluccius capensis male	36.00	130	3.24	324
Zeus faber	28.00	40	2.52	
Synagrops microlepis	24.00	2480	2.16	
Trachurus capensis	20.00	160	1.80	
Helicolenus dactylopterus	20.00	160	1.80	
Sepia orbignyana	2.00	120	0.18	
Parapandalus brevipes	1.60	200	0.14	
MYCTOPHIDAE	1.60	360	0.14	
Merluccius polli	0.80	8	0.07	326
Total	1112.00		100.00	

ANNEX III INSTRUMENTS AND FISHING GEAR USED.

ACOUSTIC INSTRUMENTS

Two SIMRAD scientific echo sounders, EK 400/38 kHz and EK 400/120kHz were used during the survey for estimation of fish density. The EK 400/38 was coupled to a digital integrator QD as well as to an analog integrator QM. The details of the instrument settings used are as follows:

	EK 400/38	EK 400/120
Range	0-100 or 0-250	0-100
Transmitter	High (5000 W Nom)	High (1250 W Nom)
Bandwith	3.3 kHz	3.3 kHz
Pulselength	1 ms	1 ms
TVG	20 log R	20 log R
Attenuator	20 dB	0
Rec. gain	8	5
Transducer	Split beam	Ceramic 10cm Ø

QD settings: Threshold 10 to 24 mv. Gain: - 35.9

QM settings: Gain 20 dB x 10. Threshold 7

An ES 400 color displayer was used for observation of hake in mid waters and for indications of target strengths.

A calibration experiment using a standard copper sphere performed in Baia dos Tigres on 12/6/90 gave the following results:

30x30 transducer: SL+VR 142.0, instr.constants 1 ms: 0.82, 0.5 ms: 1.94, gain QD 1 ms: 29.1, 0.5 ms: 32.9. ES transducer: SL+VR 135.4, instr. const. 3.89, gain QD 35.9

HYDROGRAPHY

Temperature, salinity and oxygen were sampled at standard depths with Nansen bottles. Oxygen was measured with the Winkler method and salinity determined with an inductive salinometer. Surface temperature was recorded at 4 m depth with a thermograph.

FISHING GEAR

Bottom trawl: High opening shrimp and fish trawl with net headline 31 m (floatline), foot-rope 47 m, gear with 12 cm diameter roller disks, 40 m sweeps, estimated headline hight 6 m and distance between wings during towing 18-20 m.

Pelagic trawl: Modified "Harstadtrawl" with a vertical opening of 20-25 m.

Cod ends of trawls with fine meshed inner lining.

